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ABSTRACT

The reading improvement activities in this handbook are intended for use by middle school science teachers. Focusing on study skills, vocabulary development, and comprehension development, the activities include (1) surveying science texts and science content area reading materials, (2) outlining, (3) spelling, (4) syllabication, (5) word recognition, (6) using synonyms, (7) understanding the main idea of a text, (8) remembering details, (9) determining the sequence of events stated in the text, and (10) making inferences from texts. Many of the descriptions of these activities include samples of teacher planning sheets and master copies of student worksheets. The appendixes contain additional advice and materials that science teachers can use to develop their students' content area reading skills. These items include a dictionary of word parts, a list of the reading skills needed in science instruction, the Fry and the SMOG readability formulas and directions for their use, a five-part strategy for word attack, and hints on accenting and syllabication of science vocabulary. (RL)

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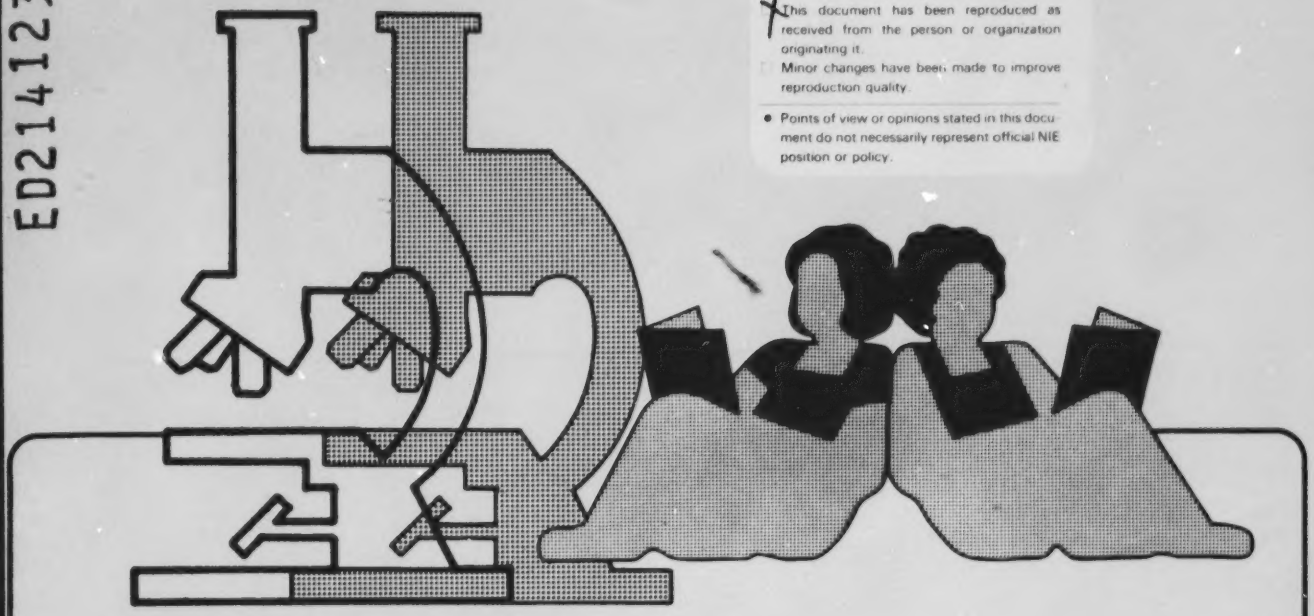

A Classroom Teacher's Guide to
Reading Improvement in Middle School Science

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P.K. Yonge Developmental Individualized Reading
P.K. Yonge Laboratory School/College of Education/University of Florida

An ESEA Title IV-C Dissemination Project

This Guide is designed to assist persons in implementing the P. K. Yonge Developmental Individualized Reading Program which has been in operation since 1970 at the P. K. Yonge Laboratory School and was developed by the following persons:

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A CLASSROOM TEACHER'S GUIDE TO

READING IMPROVEMENT

IN MIDDLE SCHOOL SCIENCE

A Resource Publication for the
Public Schools of Florida

Resource Monograph No. 19

P. K. Yonge Laboratory School
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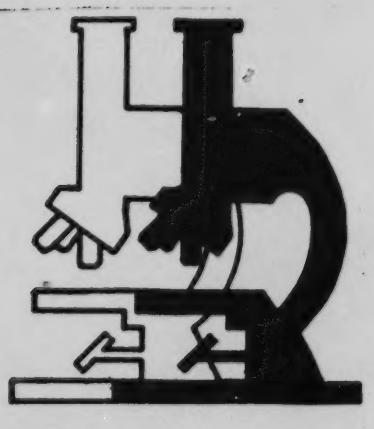
1979



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Department of Education
1979

P. K. Yonge Developmental
Individualized Reading
An ESEA Title IVC
Dissemination Project

A CLASSROOM TEACHER'S GUIDE TO

READING IMPROVEMENT

IN MIDDLE SCHOOL SCIENCE

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Page	Material	Author or Publisher
5	Concepts in Science	Harcourt Brace Jovanovich, Inc.
97	The Eighth Day of the Week	Addison Wesley Publishing Company
107	Teaching Reading Skills in Secondary Schools	Harper & Row, Publishers, Inc.
111	"SMOG Grading - A New Readability Formula," Journal of Reading	International Reading Association
111	Adapted SMOG Readability Formula	Lawrence L. Smith
113	Improving Reading In Every Class: A Sourcebook for Teachers	Allyn and Bacon
120	Electric Board	John Fielding

INTRODUCTION

The P. K. Yonge model for reading improvement at the middle and high school levels has been developed and tested over the past seven years, both in the Laboratory School and in several public schools in Florida. The model features a developmental, individualized approach to improving reading. Utilizing diagnostic and prescriptive procedures, the program includes all pupils at a grade level and focuses on improvement of reading skills considered important to the pupil. After fifteen hours practice in a laboratory, distributed over six weeks, reading rate, vocabulary, and comprehension have been substantially increased for most pupils (Guttinger, Hines & Larson 1972, Guttinger, 1974, Guttinger & Hines, 1977.)

As significant as is the progress made by participation in the reading laboratory, the real potential for growth in reading once students have left the laboratory setting is through extension of opportunities for improvement into content area classroom. The presence of the developmental individualized reading laboratory in schools has been found to stimulate content area teachers to seek assistance from the reading laboratory directors in selecting resource materials and in providing appropriate reading skill development experiences in the classroom.

As a result of numerous requests from these content area teachers, a group of reading laboratory directors devoted several weeks during the summer of 1974 to the development of materials and guides for the content areas of science, social studies, and language arts. During the 1974-75 school year these guides were tested in approximately forty schools in thirteen Florida counties.

After receiving feedback from teacher-users, the science guide was edited and revised for printing in 1976. During the 1975-77 school years, additional testing of the language arts and social studies materials was conducted. When Title IVC funds became available to the P. K. Yonge Project in December, 1977, a revision and updating of the original guides were made possible. This handbook is one of the products of those endeavors.

Recognizing that the content area teacher is an expert in his or her own field, equipped with a vast back-ground of experience and knowledge, no attempt has been made in the design of the activities presented here to prescribe language, vocabulary, or concepts to be taught. Neither are the suggestions intended to be comprehensive. Rather, they are presented as examples of the kinds of things which may be used to facilitate content area teaching by providing a variety of supplemental activities related to the process of reading.

No sequence is implied in the order in which activities are presented. The authors agree that basing variety on the needs of readers in the classroom is essential. Optimum enhancement of the reading skills developed during the reading laboratory experience and the subsequent transfer of these skills to the content area curriculum is most likely to occur when attention is focused on those individual needs.

Hellen I. Guttinger, Director
Reading Dissemination Project
ESEA Title IVC
P.K. Yonge

September, 1978

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STUDY SKILLS

ACTIVITIES

SKILL: Study Skills - Title Page

MATERIALS: Textbook or other instructional materials, teacher-made worksheet

TEACHER DIRECTIONS:
Using the Title Page of the textbook as a source, the teacher asks questions orally or provides each student with a worksheet similar to the one in the Sample Item.

Title Page Task Sheet

SAMPLE ITEM:

1. What is the title of your textbook?
2. Who is (are) the author(s) of your textbook?
3. What company publishes the book?

ALTERNATIVES:

1. Title Pages from discarded books are mounted on cardboard. Questions relating to each Title Page are developed and mounted on the reverse side of the cardboard. These lessons can be placed in boxes in a kit format.
2. Title Pages from discarded books are made into transparencies. Questions relating to each Title Page may be included on the transparency or each student may be given a worksheet.

SKILL: Study Skills - Copyright Page

MATERIALS: Textbook or other instructional material, teacher-made worksheet

TEACHER DIRECTIONS:

Using the Copyright Page of the textbook as a source, the teacher asks questions orally or provides each student with a worksheet similar to the one in the Sample Item.

Copyright Page Task Sheet

SAMPLE ITEM:

1. When was your textbook first issued a copyright?
2. To whom would you write in order to get permission to reproduce material in the textbook?
3. How many copyright dates does your textbook show? What are they?

ALTERNATIVES:

1. Copyright Pages from discarded books are mounted on cardboard. Questions relating to the Copyright Pages are developed and mounted on the reverse side of the cardboard. These lessons can be placed in boxes in a kit format.
2. Copyright Pages from discarded books are made into transparencies. Questions relating to each Copyright Page may be included on the transparency or each student may be given a worksheet.

SKILL: Study Skills - Table of Contents

MATERIALS: Textbook or other instructional materials, teacher-made worksheet

TEACHER DIRECTIONS:

Using the Table of Contents of the textbook as a source, the teacher asks questions orally or provides each student with a worksheet similar to the one in the Sample Item.

Table of Contents Task Sheet

SAMPLE ITEM:

1. On what page(s) do you find the Table of Contents?
2. How many Units does your text contain?
3. On what page does Unit 3 begin?
4. In what unit would you expect to find information about energy?
5. How many chapters are included in Unit 6?
6. In what chapter would you expect to read about bacteria?
7. On what page does the Glossary begin?
8. On what page does the Index begin?

ALTERNATIVES:

1. Tables of Contents from discarded books are mounted on cardboard. Questions relating to the Table of Contents are developed and mounted on the reverse side of the cardboard. These lessons can be placed in boxes in a kit format.
2. Tables of Contents from discarded books are made into transparencies. Questions relating to each Table of Contents may be included on the transparency or each student may be given a worksheet.

PARTS OF A BOOK

4

SKILL: Study Skills - Glossary

MATERIALS: Textbook or other instructional materials, teacher-made worksheet

TEACHER DIRECTIONS:

The teacher selects words from a given chapter or section of the textbooks with which students are expected to become familiar. Worksheets are constructed by using each word (either correctly or incorrectly) in a sentence similar to the ones in the Sample Item.

SAMPLE ITEM:

Glossary Task Sheet #1

DIRECTIONS: In order to answer each question, you will need to look up the underlined words in your glossary. Answer each item either true or false. If the item is false, use the underlined word correctly in a sentence of your own.

1. When people are cheerful, we say they have a good sense of humus.
2. Friction is a story that is not true.
3. Bacilli are rod shaped bacteria.

SKILL: Study Skills - Glossary

MATERIALS: Textbook, teacher-made worksheet

TEACHER DIRECTION:
Select glossary words with which the student needs to become familiar. Develop a worksheet which gives a set of clues to each glossary word.

SAMPLE ITEM:

Glossary Task Sheet #2

DIRECTIONS: Read each set of clues. Use each set of clues to help you locate a word in the glossary.

1. What word -

   a) is on page 364 of your glossary
   b) has two syllables
   c) means any substance that can burn and thus release energy

2. What word -

   a) begins with the letter "m"
   b) is a compound word
   c) means an organism generally too small to be visible without a microscope

3. What word -

   a) means the smallest single-celled plants without chlorophyll
   b) begins with the letter "b"
   c) has four syllables

Answers:

1. Fuel
2. Microorganism
3. Bacteria

Source: From Concepts in Science, Brown Level 6, by Paul F. Brandwein, Elizabeth K. Cooper, Paul E. Lackwood, Elizabeth B. Hone, Margaret Cottom-Winslow, Thomas P. Fraser, Morsley G. Giddings, 1975, pp. 364 - 368. (Reprinted by permission of Harcourt Brace Jovanovich, Inc. from CONCEPTS IN SCIENCE, Newton Edition by Paul F. Brandwein et al.; copyright © 1975 by Harcourt Brace Jovanovich, Inc.)

SKILL: Study Skills - Index

MATERIALS: Textbook or other instructional material, teacher-made worksheet

TEACHER DIRECTIONS:

Using the textbook or other instructional material as a source, the teacher asks questions orally or provides each student with a worksheet similar to the one in the Sample Item.

SAMPLE ITEM:

Index Task Sheet #1

DIRECTIONS: Read each question. Write the key word(s) which you would look up in your index in order to find the answer to the question.

KEY WORDS

1. Where do bacteria grow?
2. What are antibiotics?
3. What is the method used to control smallpox?
4. Who were the scientists who developed a method for controlling polio?
5. How does the process of filtration work to control impurities in water?

Text: Concepts in Science, pp. 369 - 376

PARTS OF A BOOK

SKILL: Study Skills - Index

MATERIALS: Teacher-made worksheet

TEACHER DIRECTIONS:

The teacher constructs a worksheet similar to the one in the Sample Item. A copy is given to each student.

SAMPLE ITEM:

Index Task Sheet #2

DIRECTIONS: Under the topic, arrange the subtopics in alphabetical order, as they would appear in an index.

Topic: Environment

_____

_____

_____

_____

_____

_____

Subtopics polution of, 68, 320; adaptation to,40; interdependence of living things in,40,76, 120, 131,350; changing, 40, 132,358; conservation of, 17, 77, 116,359; living,76.

Text: Concepts in Science, p.371

PARTS OF A BOOK

SKILL: Study Skills - Index

MATERIALS: Textbook

TEACHER DIRECTIONS:

Using the Index of the textbook or other instructional material as a source, the teacher asks questions orally or provides each student with a worksheet similar to the one in the Sample Item.

SAMPLE ITEM:

Index Task Sheet #3

_____ 1. On what pages would you find information about the general topic carbon dioxide?

_____ 2. On what page would you find information about Samuel Morse?

_____ 3. On what page would you find infcrmation about parts of a telephone?

_____ 4. On what page would you find information about the formula for water?

_____ 5. On what page could you find a picture of Barnard's Star?

Text: Concepts in Science, pp. 369 - 376

PARTS OF A BOOK

SKILL: Study Skills - Title, Introductory Paragraph and Summary

MATERIALS: Textbook or other instructional materials, teacher-made worksheet, 24" x 3" strip of construction paper, marking pencil

TEACHER DIRECTIONS:

The teacher writes the chapter title on the strip of construction paper for placement in the classroom. The students are asked to locate the page on which the chapter begins. Through discussion, the students analyze the chapter title and "guesstimate" as to what kinds of information the chapter contains.

The teacher, or a student who has had time to prepare, reads the introductory paragraph and summary to the class in order to compare their analysis of the title.

A worksheet similar to the one in the Sample Item is given to each student.

SAMPLE ITEM: Survey Task Sheet #1

The title of your new unit is: _____

Choose one of the items below. Return this sheet and your work to your teacher by: _____.

1. Check a current T. V. Guide and find a program that relates to the new chapter.
   Title of program: _____
   Date and time of program: _____ Channel _____

2. Show this sheet to an adult you know and ask him/her to list some things that might be learned by studying this chapter.

   _____

   _____

   _____

   _____

3. Find an article in a magazine or newspaper that relates to the new chapter.

** 4. Write and mail a letter to one of the following addresses. Request information that will help the class with the study of the new chapter.

5. Find someone who will be willing to speak to the class on a topic that relates to the new chapter.

Name of speaker: _____ Telephone # _____
Date the speaker wishes to visit: _____

6. Draw or find pictures for the bulletin board that relate to the new chapter.

7. Locate in the library 4 or 5 books that relate to the new chapter and would be of interest to your classmates. The books may be fiction or nonfiction.

	Title of Book	Call Number
a.		
b.		
c.		
d.		
e.		

8. Your choice. I am going to: _____

Students should be encouraged to make different choices as each new chapter is introduced rather than select the same activity.

** Addresses for obtaining free and inexpensive
be found in the following book:

Educators Guide to Free & Inexpensive Materials
Educators Progress Service, Inc.
Randolph, Wisconsin 53956

SKILL: Study Skills - Headings and Subheadings

MATERIALS: Textbook or other instructional material, teacher-made worksheet

TEACHER DIRECTIONS:

In the initial lesson regarding the surveying of headings and subheadings, the teacher shows the students how to distinquish between each (i.e., the different type of print, the use of colored print, etc.). Afterwards, the students should be able to work independently.

A worksheet similar to the one in the Sample Item is given to each student. These are completed in small group sessions or independently. Ultimately students will be able to construct the outline without using a worksheet.

SAMPLE ITEM:

Survey Task Sheet #2

DIRECTIONS: Part of the outline has been completed. Use the headings and subheadings to Unit 3, Searching for Longer Life, to finish it.

I. SEARCHING FOR LONGER LIFE

A. Capturing the Tiniest

1. Seeing Tiny Organisms

2. _____

B. Plants Without Color

1. _____

2. _____

Text: Concepts in Science, p. 83

C. _____

1. _____
2. _____
3. _____
4. Helping Your Body Defenses

D. _____

1. _____
2. _____
3. _____

E. A Problem -- for You and Yours

1. _____
2. _____
3. _____
4. _____

F. The Main Concept-Controlling the Environment

1. _____
2. Focus on the Scientist's Ways
3. _____

II. A NEW VIEW OF INTERDEPENDENCE

SKILL: Study Skills - Diagrams

MATERIALS: Textbook or other instructional material, teacher-made worksheet

TEACHER DIRECTIONS:

The teacher selects diagrams from a given chapter or section of the textbook. A worksheet similar to one of those in the Sample Item is constructed. (The worksheets below are arranged in order of increasing difficulty.)

SAMPLE ITEM:

Survey Task Sheet #3

DIRECTIONS: Turn to the page number in parenthesis. Look at the diagram. Place a check before all words that name something you can see in the diagram. Add others you can support.

I. (page 110)

_____pump _____ water _____gravel

_____concrete _____ pipe _____sand

or

Survey Task Sheet #3

DIRECTIONS: Turn to the page number in parenthesis. Look at the diagram. Place a check before all words that name an object or idea that the diagram makes you think of. Add others you can support.

I. (page 110)

_____ Industry _____ Environment

_____ Danger _____ Purification

_____ Pollution _____ Prosperity

Test: Concepts in Science, p. 110

SURVEYING

or

Survey Task Sheet #3

DIRECTIONS: Turn to the page number in parenthesis. Look at the diagram. Place a check before all statements that you believe tell about the diagram. Add other statements that you can support.

I. (page 110)

_____ Untreated water has bacteria in it.

_____ Sand and gravel act as filters for the water.

_____ A pump sends the water to the city.

_____ Untreated water goes directly to the pump.

SKILL: Study Skills - Charts

MATERIALS: Textbook or other instruction material, teacher-made Worksheet

TEACHER DIRECTIONS:

Using a chart in a particular chapter or section of the textbook as a source, the teacher asks questions orally or provides each student with a worksheet similar to the one in the Sample Item.

SAMPLE ITEM:

Survey Task Sheet #4

DIRECTIONS: Turn to page 106 in the textbook. Use the chart on that page to answer the following questions.

1. What is the title of the chart?
2. What scientist discovered a method for controlling smallpox?
3. When was a method for controlling malaria discovered?
4. What is another name for hydrophobia?
5. What method is used for controlling yellow fever?

Text: Concepts in Science, 106

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SKILL: Study Skills - Chapter Introductions

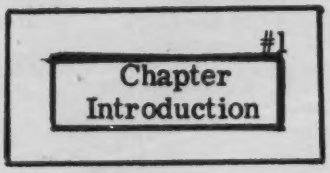
MATERIALS: The introductions from textbook chapters or other instructional material, overhead projector, marking pencil, transparency, teacher-made Worksheet

TEACHER DIRECTIONS: The teacher cuts the chapter introductions from discarded textbooks and makes a transparency. Each introduction is numbered with the marking pencil. The teacher uses the overhead projector to show the intorductions to the class.

Each student is given a worksheet that lists the chapter titles from which each introduction was taken. After reading a particular introduction, the student matches the number on it with the appropriate chapter title.

SAMPLE ITEM: Survey Task Sheet #5

1. Chapter Introduction Sheet



2. Worksheet Diagram

Directions: Read each chapter introduction. Write the number of the introduction next to the title which you think matches it.

____ The Universe is in Constant Change

____ How to Calculate a Star's Temperature

____ The Energy of Stars

____ Star Movements

____ The Stars: How many?

Text: Concepts in Science, 323

SKILL: Study Skills - Categories

MATERIALS: Teacher-made worksheet, timer, four or five books at various reading levels from each of the following categories:

1) Botany
2) Zoology
3) Astronomy
4) Geology
5) Archaeology
6) Chemistry
7) Paleontology
8) Medicine
9) Meteorology
10) Psychology

TEACHER DIRECTIONS:

Each category of books is placed at a learning station. A card at each station tells the category. The class, in groups of 3-4 students rotates from one station to the next at the signal from the teacher. At each station the students are to survey the books by:

1) reading the title
2) reading the comments on the inside flap of the jacket (if there is one)
3) reading the Table of Contents
4) reading the introductory paragraph
5) looking at pictures and diagrams

SAMPLE ITEM:

Survey Task Sheet #6

DIRECTIONS: You have been chosen by the President to be the first visitor from Earth to the newly discovered planet, Varwunda. The beings on Varwunda are friendly and happy, however, they know nothing of science. Since you are a world famous scientist your job will be to teach the Varwundans about science as it is on the Earth. As you survey the books at each station read the category card. Survey the books at each station. Decide what book would be most useful to assist you in teaching

SURVEYING

the Varwundans. Write the title of the book that you select next to the appropriate category on this sheet.

Botany_____

Zoology_____

Astronomy_____

Geology_____

Archaeology_____

Chemistry_____

Paleontology_____

Medicine_____

Psychology_____

ALTERNATIVES:

This list can be used as the basis of a self-selected reading list. If the student wishes to make a substitution in any category he/she is free to do so.

SURVEYING

SKILL: Study Skills - Headings and Subheadings

MATERIALS: Teacher-made worksheet

TEACHER DIRECTIONS:

The teacher develops a worksheet based on the chapter outline of headings and subheadings. The students are assigned to groups of four to five. One student in the group acts as the recorder and writes the responses of the others in the group. Each recorder reports to the class and a composite list of questions is constructed.

SAMPLE ITEM:

Questioning Task Sheet #1

DIRECTIONS: You will be playing the role of the teacher. Your job is to construct questions for a test on "Unit 3, Searching for Longer Life." Think of a question that you would ask relating to each step of the outline. Write your question in the space provided. The first one has been done for you.

Outline	Question
I. SEARCHING FOR LONGER LIFE	What kinds of tools help to have a longer life?
A. Capturing the Tiniest	
1. Seeing Tiny Organisms	
2. Types of Bacteria	
B. Plants Without Color	
1. How a Mold Gets Food	
2. A Bacterium and its Food	

(The remaining steps of the outline would be included on the actual worksheet.)

QUESTIONING

Text: Concepts in Science, p. 83

SKILL: Study Skills - Headings and Subheadings

MATERIALS: Teacher-made worksheet, 20-25 books in various science categories (at least 2 different titles to each category)

TEACHER DIRECTIONS:

This activity is used at a learning station or set up as an activity that students work on when they have finished their regular assignments. The books are placed at a station or on a table in the classroom. Each student is given a worksheet similar to the one in the Sample Item.

SAMPLE ITEM:

Questioning Task Sheet #2

DIRECTIONS: Part of your job as head science researcher at Parapsychology Institute is to appear on a weekly television program. During each broadcast hundreds of TV viewers call with questions for the following week's program.

Since you cannot answer all of the questions in depth, you frequently refer the TV viewers to books which give additional information.

On this worksheet you will find some of the questions for this week's show. Read each question. Then survey the books on the table. Write the title of the book which you think would give additional information about each question.

Question from Mr. Theodore Bear:

"What are the eating habits of the Australian Koala?"

Question from Professor Kohoutec:

"When will Halley's Comet reappear?"

QUESTIONING

SKILL: Study Skill - Headings and Subheadings

MATERIALS: Textbook, Teacher-made worksheet

TEACHER DIRECTIONS:

The teacher assigns the students into teams of two. Each student receives a copy of the composite list of questions which were developed while completing Questioning Task Sheet #1. Team members read the textbook material under heading or subheading. After reading each section, the team members jot down words or phrases which would answer the question(s). The back of the card is used for this purpose.

SAMPLE ITEM:

Questioning Task Sheet #3

Heading or subheading title: Types of Bacteria What are some of the kinds of bacteria?	Heading or subheading title: Plants Without Color What are some nongreen plants? Where do they live?
Heading or subheading title: How a Mold Gets Food What are the needs of fungi?	Heading or subheading title: A Bacterium and its Food Are bacteria harmful?

Text: Concepts in Science, p.83 QUESTIONING

SKILL: Study Skills - Recall and Review

MATERIALS: Composite set of question cards with the student's answers on the back. (These were completed by the student in the previous lesson, Question Task Sheet, #3)

TEACHER DIRECTIONS:

In order to practice Recall the students are assigned to small groups, teams, or work individually. Each student tries to answer the question on the front of the card without referring to the answer side of the card. The same procedure as above is used for Reviewing before a test.

SAMPLE ITEM:

Recall and Review Task Sheet

Heading or Subheading Types of Bacteria What are some kinds of bacteria?	Possible Answers: Bacilli - rod shaped Cocci - spherical Spirillum - corkscrew
Heading or Subheading Plants Without Color What are some plants without color? Where do they live?	Possible Answers: Bacteria Fungi On other living things On bread

Text: Concepts in Science, p. 83

RECALL AND REVIEW

SKILL: Study Skills - Skimming

MATERIALS: Textbook or other instructional materials

TEACHER DIRECTIONS:

Students are assigned to teams of 4 - 5. A team recorder is selected. Each team is assigned a particular section of the textbook. Members of each team skim the assigned portion of the text to find words and phrases which are interesting. The team recorder writes these down. In this way, each team develops a word collage. The results of each team's efforts are shared with the class. This activity provides a quick introduction to a new chapter.

SAMPLE ITEM:

Skimming Task Sheet

microorganisms	tiny rod shapes
bacteria	disease
cultures	spherical bacteria
found near you	dead animals
humus	feed on tissues of the body

ALTERNATIVES:

Fictional materials which pertain to a particular unit of study can be used in place of the text.

Cut out letters, words and phrases from newspapers and magazines to create an attractive word collage.

SKILL: Study Skills - Scanning

MATERIALS: Textbook, Flair pens of different colors, paper

TEACHER DIRECTIONS:

Place a sheet of paper on the bulletin board. Divide the class into groups of 5 - 6 students. Give each group time to choose a group leader and one of the Flair-tip pens.

Tell the students that, at the beginning of each science class, their task will be to locate compound words in their textbooks. After locating a compound word, each student is to write the word and the page on which it is found on a sheet of scratch paper. At the end of the "search time" each group leader collects the words from the group members and writes these words on the bulletin board paper with the Flair-tip pen. At the end of a week, the group with the most compound words is the winner.

SAMPLE ITEM:

Scanning Task Sheet #1

Red Group	Green Group	Blue Group	Yellow Group	Orange Group
1. into*	1. earthquake	1. cannot	1. cuplike	1. into*
2. statement	2. however	2. schoolyard	2. jelly fish	
3. itself	3. windbreak		3. within	
	4. evergreen			

*Words used by one team may be used by another team as well.

ALTERNATIVES:

1. During "searchtime" students may work in groups or individually.

2. Options in lieu of compound words:
   a. Vc/cv words: tis/sue; fen/der
   b. Words that begin with a particular letter
   c. Words with a particular number of syllables
   d. Words with prefixes
   e. Words with suffixes
   f. Words in italics or boldface print

SCANNING

SKILL: Study Skills - Scanning

MATERIALS: Textbook or other instructional material, 3-minute egg timer

TEACHER DIRECTIONS:

Students are asked to scan a particular section of the textbook and list words which belong in a special category. A time limit of 3 minutes for each question is set.

SAMPLE ITEM:

Scanning Task Sheet #2

1. List all of the types of bacteria mentioned on page 86.
2. On pages 84 - 106, list all of the words in bold face print.
3. In Unit 3, find all of the Investigations and list the page numbers where they are found.
4. In Unit 3, find all of the charts and write the title of each.

ALTERNATIVES:

Students might be asked to arrange each list in alphabetical order after the class has made a composite list.

Text: Concepts in Science , 83 - 131

SCANNING

SKILL: Study Skills - Following Directions

MATERIALS: Teacher-constructed worksheet

TEACHER DIRECTIONS:

Each student is provided with a copy of the test in the sample item. Stress that this is an individual test to be completed without conferring with fellow students.

SAMPLE ITEM:

FOLLOWING DIRECTIONS TEST

Can You Follow Directions? - Timed Test; you have three minutes.

1. Read everything carefully before you do anything.
2. Put your name in the upper right hand corner of this paper.
3. Circle the word "NAME" in sentence number two.
4. Draw five small squares in the upper left hand corner of this paper.
5. Put an "X" in each square.
6. Put a circle around each square.
7. Sign your name under the title of this paper.
8. After the title, write "YES YES YES."
9. Put a circle completely around sentence number seven.
10. Put an "X" in the lower left hand corner of this paper.
11. Draw a rectangle around the word "FIVE" in sentence four.
12. On the back of this paper multiply 703 by 66.
13. Draw a triangle around the "X" in sentence number ten.
14. Loudly call out your first name when you get this far.
15. If you think you have followed directions carefully to this point, call out "I HAVE IT."
16. On the reverse side of this paper add 8950 and 9805.
17. Put a circle around your answer and a square around the circle.
18. In your normal speaking voice, count from ten to one backwards.
19. Punch three small holes in the top of this paper with your pencil point.
20. If you are the first person to reach this point, loudly call out "I AM THE FIRST PERSON TO THIS POINT. I AM THE LEADER IN FOLLOWING DIRECTIONS."
21. Now that you have finished reading everything carefully do only sentences one and two.

SKILL: Study Skills - Following Directions

MATERIALS: Textbook or other instructional material, teacher-made worksheet

TEACHER DIRECTIONS:

After the students have studied a particular chapter or section of the textbook, the teacher develops a worksheet similar to the one in the Sample Item. The questions are based on material with which the students are concerned with the process of following written directions.

SAMPLE ITEM:

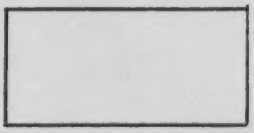
Following Directions Task Sheet

1. If some bacteria are harmful, underline the first word in this sentence.

2. If bacilli are rod shaped, write your age in the blank at the end of this sentence._____

3. If fungi are not nongreen plants, underline all of the words in this sentence which begin with the letter "t".

4. If bacteria are living cells, draw a spirilli in the box at the end of this sentence.



5. If all bacteria are beneficial to man, work the following math problem. 2 x 53 = _____.

FOLLOWING DIRECTIONS

SKILL; Study Skills - Outlining

MATERIALS: Terms appropriate to science concepts

TEACHER DIRECTIONS:

In each exercise below there is a list of words and a skeleton outline. Each list of words includes both main topics and subtopics. The skeleton outline shows how many main topics are in the list and how many subtopics are under each main topic. Have students fill in the skeleton outline with main topics and subtopics.

SAMPLE ITEM:

I.	II.
A.	A.
B.	B.
C.	C.
D.	D.
smallpox	disease
penicillin	malaria
achromycin	streptomycin
antibiotics	polio
yellow fever	

OUTLINING

VOCABULARY

ACTIVITIES

SKILL: Vocabulary - Word Recognition

MATERIALS: Textbook, teacher-made exercise, cardboard

TEACHER DIRECTIONS:

Compile the vocabulary to be studied in a particular unit of the textbook into lists for introductory vocabulary screening. Place them on a ditto master and run enough copies for each of your students, plus one extra to be placed on a piece of cardboard. Allow the students to read off the copy on the blackboard while you score on another. Be sure to indicate the student's name on the teacher's copy for record keeping purposes. Have students begin reading the first list and read only those words they know. Place a mark beside those words the student knows. Assume he/she does not know words he/she does not read. Since this activity requires a one to one approach, it may be advisable to assign an exercise which will keep the class busy while you test each student. A certain degree of privacy will be necessary for the student being tested.

SAMPLE ITEM: (See the following 2 pages.)

ALTERNATIVE :

Lists may be compiled according to various categories such as words in biology, geology, botany or in relation to units of study such as stars, planets or energy for introductory vocabulary screening.

(Continued on next page)

Sources: Format of Slosson Oral Reading Test adapted by Anna Meehan, Palm Beach County Schools

INFORMAL WORD RECOGNITION INVENTORY

- SCIENCE -

Concepts in Science - 6

Unit Seven - Harvesting the Atom

Unit Eight - Probing the Stars

Name_____ Age_____ Date_____ School Grade _____

List A	List B	List C
1. radiation	1. investigation	1. test tube
2. atmosphere	2. opposite	2. splint
3. phenomena	3. gas	3. liquid
4. observatory	4. bubbling	4. electric
5. launch	5. lighter	5. current
6. physicist	6. heavier	6. inverted
7. astronomer	7. combination	7. reaction
8. transmit	8. flame	8. substances
9. data	9. formation	9. nuclear
10. universe	10. compound	10. neutrons
11. gratify	11. evidence	11. protons
12. curiosity	12. symbol	12. particles
13. electronic	13. split	13. fused
14. chemically	14. dilute	14. fusion
15. hydrogen	15. sulfuric acid	15. subtract
16. oxygen	16. apparatus	16. burst
17. molecule	17. formula	17. fission
18. atom	18. amount	18. bomb
19. nuclei	19. clue	19. collect
20. tremendously	20. sunlight	20. starve

Text: Concepts in Science, 271-402

WORD RECOGNITION

List D

1. uranium
2. produce
3. definitely
4. obtained
5. careful
6. spectroscope
7. helium
8. information
9. measured
10. atomic weights
11. arithmetic
12. units
13. matter
14. total
15. subtract
16. difference
17. mass
18. remember
19. examination
20. intense

List E

1. abundant
2. supply
3. temperature
4. nuclear reactor
5. determine
6. steelworker
7. accurately
8. glowing
9. white-hot
10. red-hot
11. object
12. analyze
13. lens
14. prism
15. solar
16. diagram
17. spectrum
18. spectra
19. bluish
20. violet

List F

1. Deneb
2. space
3. constellation
4. Antares
5. tending
6. Algol
7. solution
8. beaker
9. motion
10. kinetic energy
11. pyrex
12. thermometer
13. tongs
14. flask
15. diameter
16. distance
17. vast
18. gravitation
19. Galileo
20. unnoticed

List G

1. giant
2. dwarf
3. circumstance
4. illustration
5. relative
6. orbit
7. directly
8. depend
9. techniques
10. telescope
11. Mt. Palomar
12. vantage point
13. Stonehenge
14. pillars
15. predict
16. eclipses
17. instrument
18. probing
19. section
20. galaxy

List H

1. Milky Way
2. calculate
3. photograph
4. sample
5. known area
6. trillion
7. Alpha Centauri
8. searchlight
9. light year
10. pinpoint
11. Nova
12. process
13. continue
14. explodes
15. supernova
16. plutonium
17. neptonium
18. curium
19. einsteinium
20. downstroke

List I

1. J tube
2. volume
3. mercury
4. cyclotron
5. nitrogen
6. carbon
7. potassium
8. iron
9. factory
10. whirling
11. pitched
12. Doppler Effect
13. frequency
14. vibrates
15. "red shift"
16. expanding
17. Barnard's Star
18. comets
19. approximately
20. Newton's Law

WORD
RECOGNITION

List J

1. volcanic
2. eruption
3. violent
4. dramatic
5. earthquake
6. disorder
7. indirect
8. chromosomes
9. geraniums
10. environment

SCORE

List A _____

List B _____

List C _____

List D _____

List E _____

List F _____

List G _____

List H _____

List I _____

List J _____

RAW SCORE _____

(Total number of correct words including the words below starting level.)

WORD RECOGNITION

SKILL: Vocabulary - Word Recognition

MATERIALS: Word list, index cards

TEACHER DIRECTIONS:

After determining those words which are not part of each student's sight vocabulary in Science, have students create their own word file of "words to learn" using index cards. The words may be placed on one side and the definition on the reverse side for further study. The student can set up a contract with the teacher as to how many words will be tackled each week. Upon completion of this goal, the student may be tested by the teacher. It might be wise to encourage students to help one another in fulfilling their goals. One or two days a week could be set aside for independent vocabulary study.

SAMPLE ITEM: The number of words will vary according to each child's level of achievement.

New Word Contract

I student's name will hereby attempt to learn ## new words the week of dates

Signed _____ Student
Witness _____ Peer
Approved by _____ Teacher

WORD RECOGNITION

WORD FILE

Side A
Atomic Weight

Side B
Atomic Weight - The sum of the protons in an atom

WORD
RECOGNITION

SKILL: Vocabulary - Word Recognition

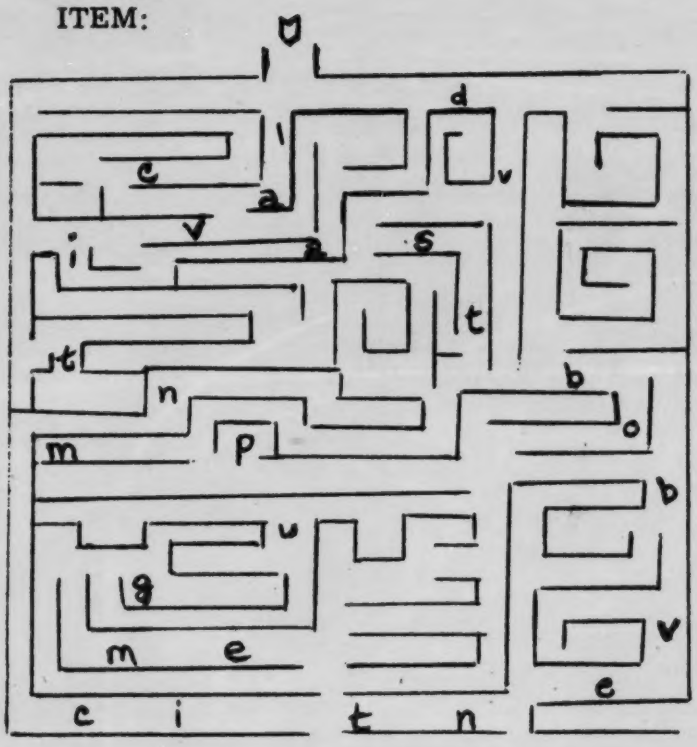
MATERIALS: Paper, pencil, teacher-made word list. Refer to Word Maze Master on page 91

DIRECTIONS: The student enters the maze. The object is to find words hidden in the maze. The student may be given the first letter of each word. The letters are in correct order within the maze. This may be a timed activity. After an appropriate length of time, the student is given the Answer Key and receives credit for each word found.

Word Maze Pencil and Paper Game

Answer
Key Words
lava
dust
bomb
vent

SAMPLE ITEM:



WORDS	
l	_____
d	_____
b	_____
v	_____

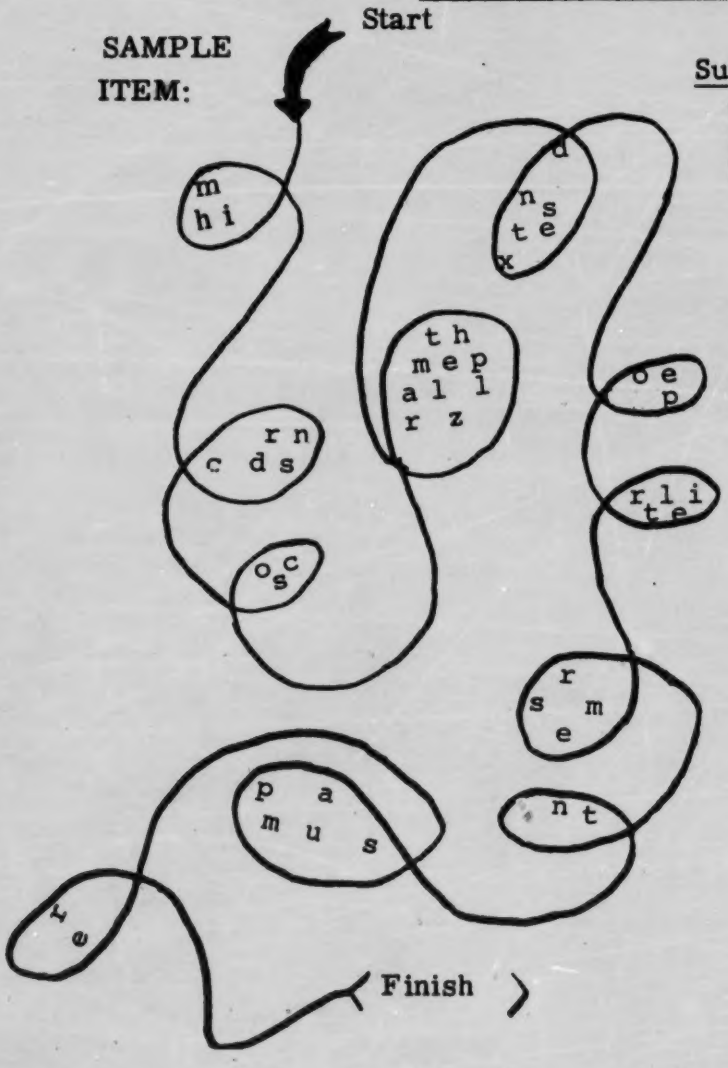
SKILL: Vocabulary - Word Recognition

MATERIALS: Paper, pencil, teacher-made word list. Refer to Word Twirl Master on page 92.

DIRECTIONS: The teacher selects five (5) words that are in some way closely related, i.e., the five words scrambled below are the names of objects the student would associate with poetry. The teacher places the letters of the words randomly in the loops as shown below. The student is instructed to start at the arrow and "travel" the line to the finish, selecting those letters that may be used to make the desired words.

Word Twirl Pencil and Paper Game

SAMPLE ITEM:



Subject

THE SCIENCE LAB

Answer Key
Words
microscope
hand lens
thermometer
experiment
litmus paper

Words
1. _____
2. _____
3. _____
4. _____
5. _____

WORD RECOGNITION

38

SKILL: Vocabulary - Word Recognition

MATERIALS: Pencil, paper, teacher-made word list, timer or clock. Refer to Add-Up-The-Words Master on page 93.

DIRECTIONS: Letters are written in each of the numbered spaces. The student is instructed to make as many words as possible from the letters in each of the numbered spaces. The object is to make as many words as possible in a 5-minute time period and have the highest number score. For each word made from a space the student is given the number score indicated by the circled number in the space.

"Add Up the Words" Pencil and Paper Game

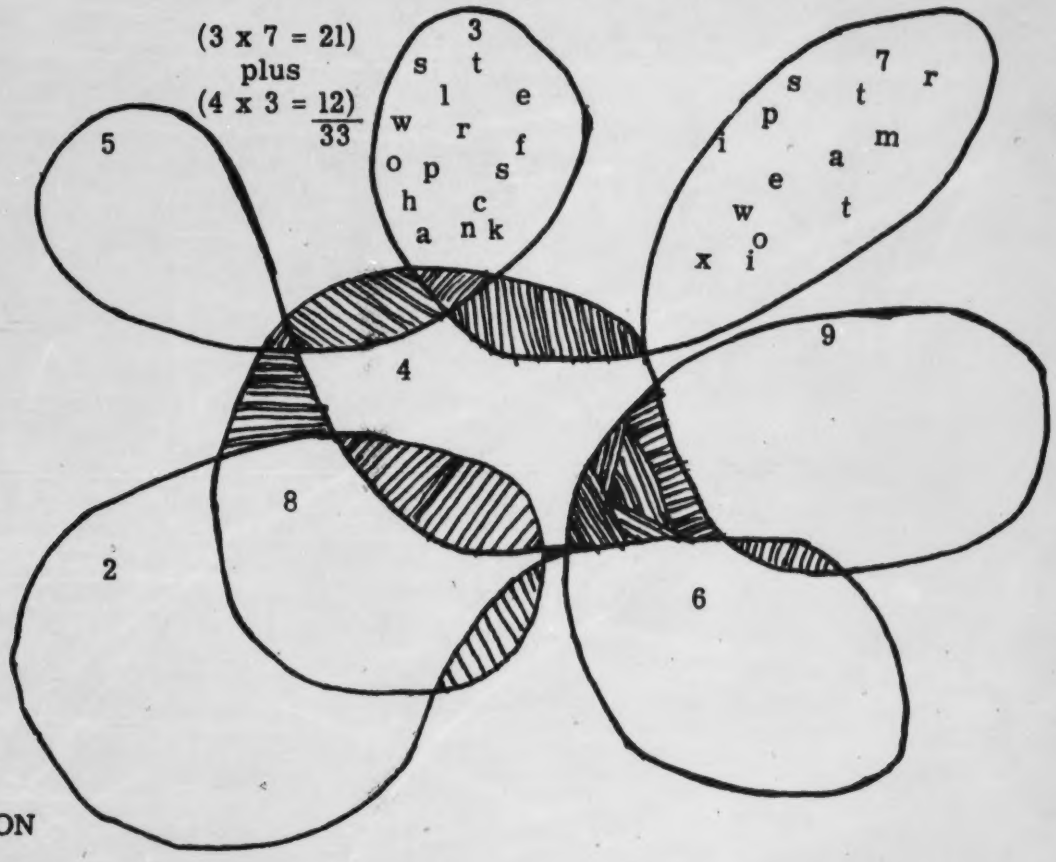
SAMPLE ITEM:

From the spaces below the following words can be made. Three of these words come from space (7) and four words from space (3). The student has made seven words, adding up to 33 points.

(7) star, mist, time

(3) ocean, flow, splash, color

(3 x 7 = 21)
plus
(4 x 3 = 12)
33



WORD RECOGNITION

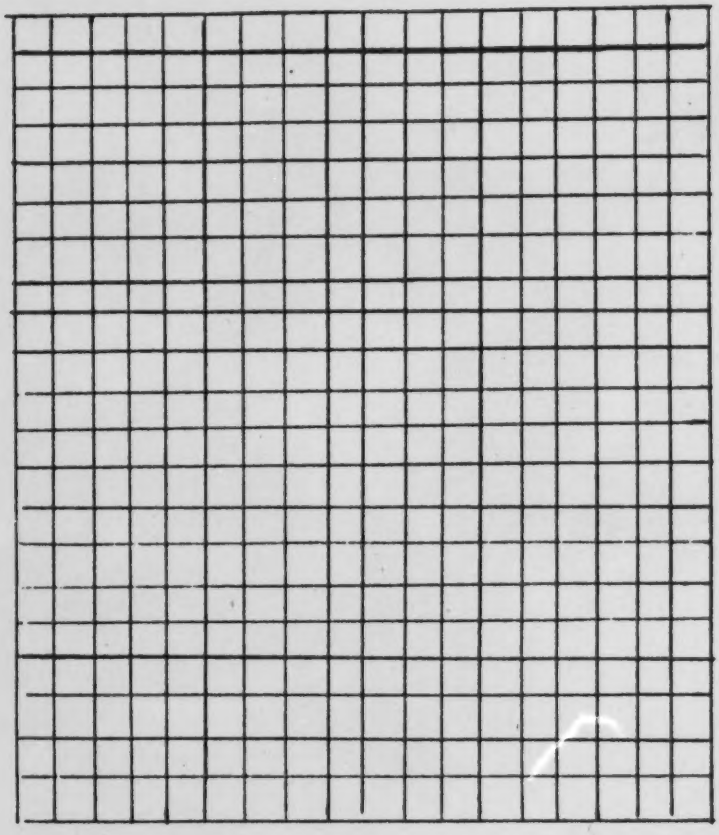
SKILL: Vocabulary - Word Recognition

MATERIALS: Pencil, paper, teacher-made vocabulary list for specific subject within content-area. (Refer to Seek and Find Master on page 94)

TEACHER DIRECTIONS:

On a sheet of ruled squares, arrange words in horizontal, vertical or diagonal order - as shown on the sample below. Fill in remaining squares with random letters. List words on side at bottom of sheet. Instruct students to find words within the squares that correspond to word list.

SAMPLE ITEM: Seek and Find Pencil and Paper Game



Ash
Block
Bomb
Cinder
Craters
Dormant volcanoes
Dust
Earthquakes
Eruption
Flood eruptions
Gas
Lava
Magma
Molten rock
Pumice
Shield
Steam
Stuff
Vents
Volcano

40

SKILL: Vocabulary - Word Recognition

MATERIALS: Textbook, teacher-made exercise. Refer to Seek and Find Master on page 94.

TEACHER DIRECTIONS:

Create a "Word Search" to correspond with a new chapter being introduced or a new concept being taught. This may be used to get students involved with new words to be learned.

SAMPLE ITEM: Word Search Pencil and Paper Game

Stars and Starlight Word Search
Unit 8 - Probing the Stars

S	Q	P	C	U	R	I	O	S	I	T	Y	X	P
U	R	N	M	F	O	R	M	U	L	A	O	H	H
L	L	A	T	M	O	S	P	H	E	R	E	P	Y
F	G	T	B	O	T	P	I	I	S	N	Z	T	S
U	C	O	U	L	F	L	H	R	O	H	A	M	I
R	P	M	J	E	G	I	Q	M	B	B	J	R	C
I	G	K	D	C	P	T	E	E	C	G	K	L	I
C	C	E	H	U	P	N	E	D	E	F	R	M	S
D	K	O	A	L	A	T	I	M	S	N	A	R	T
A	N	Z	B	E	H	F	E	Y	X	O	D	N	J
A	Y	C	D	L	L	E	C	T	Q	P	I	R	G
C	O	M	P	O	U	N	D	V	W	D	A	T	A
I	J	I	A	G	A	P	P	A	R	A	T	U	S
D	K	H	N	C	H	[illegible]	M	I	C	A	L	L	Y
L	E	L	E	C	T	R	O	N	I	C	O	T	S
M	W	X	B	A	Z	I	E	L	C	U	N	V	U

Apparatus
Atom
Atmosphere
Chemically
Collect
Compound
Data
Electronic
Formula
Gas
Molecule
Nuclei
Phenomena
Physicist
Radiation
Split
Sulfuric Acid
Transmit

Text: Concepts in Science, 323 - 359

WORD RECOGNITION

SKILL: Vocabulary - Word Recognition

MATERIALS: Textbook, teacher-made exercise

TEACHER DIRECTIONS:
Create a Bingo game using words introduced in a new chapter. Use the format of a Bingo card, but place words in the slots where numbers occur. Make about five different combinations of words to make it competitive. This game should be played after students have spent time studying the new vocabulary. This may be played by the entire class or in small groups.

SAMPLE ITEM: Bingo Pencil and Paper Game

B	I	N	G	O
radiation	atmosphere	investiga-tion	opposite	phenomena
gas	observatory	bubbling	launch	lighter
physicist	astronomer	heavier	combination	flame
formation	compound	transmit	data	universe
gratify	curiosity	electronic	chemically	hydrogen
evidence	oxygen	molecule	atom	nuclei
symbol	split	dilute	sulfuric acid	Hoffman apparatus
formula	amount	clue	apparatus	collect

SKILL: Vocabulary - Word Meaning

MATERIALS: Pencil, paper, teacher-made word list with definitions. Refer to Matching Spaces Master on page 95.

DIRECTIONS: Students are instructed to match the words in double-lined rectangles with their meaning in single-lined rectangles.

SAMPLE ITEM: Matching Spaces Pencil and Paper Game

The word "Amplitude" in rectangle A1 matches the definition in rectangle C2. Student would write C2 in line after A1, as shown below.

A1 _____
A3 _____
A3 _____
A5 _____
A7 _____

	A	B	C	D	
1	amplitude				1
2	the motion of moving masses	long waves	height of a wave	node	2
3	inertia	point where vibrations take place			3
4	sound waves making low notes	octave	a disc that vibrates easily		4
5	diaphragm				5
6					6
7					7
8			eight notes on a musical scale		8

WORD MEANING

SKILLS: Vocabulary - Word Meaning

MATERIALS: Poster board (or board similar in weight and construction); magic markers; felt-tipped writing pens; white glue* - masking tape* - scissors*; pencil and paper for each player; dice; place markers (wooden blocks or toothpaste caps) for each player, each identified by a different color; one-minute timer, (or clock with second hand). Refer to Let's Travel Master on page 96. *-optional

TEACHER DIRECTIONS:

1. Select a sheet of poster board not less than 24" x 30" and copy the design, illustrated on page 96 on the poster board with a pencil.
2. Fill in letters of the alphabet as shown.
3. In the larger spaces write words (as illustrated or other selected words that are appropriate). Optional: Instead of words, use drawings or pictures of objects that are appropriate.
4. With felt-tipped writing pen, trace the letters and words you have written in pencil.
5. With magic markers, outline the larger spaces.

HOW THE GAME IS PLAYED

"Lets Travel" - Board Game

1. The first player rolls the dice and moves the marker the correct number of spaces.
2. The player must, in one minute, write as many science-related words as possible that begin with the letter in the space. If the marker lands on a word space the player must, in two minutes, write a definition for the word that is in the word space.
3. Each player proceeds in the same manner as the first player.
4. The first player to arrive in the Goal space with the most correctly spelled and correctly defined words wins the game.

SKILL: Vocabulary - Word Meaning

MATERIALS: (1) Index cards or construction paper (if laminated for longer wear) cut into 3" x 5" cards - at least 50 cards should be made; 25 of one color and 25 of another
(2) Felt-tipped writing pen

TEACHER DIRECTIONS: On the face side of the first 25 cards a single word is written. For each of these words the remaining 25 cards have a matching definition. If construction paper is used, separate colors should be chosen for the vocabulary and the definitions.

HOW THE GAME IS PLAYED

Zimbo - Card Game

All of the word cards are dealt evenly to the players. The definition cards are placed face down in the center of the table. The player to the left of the dealer begins the game by taking the first card from the center pile. The player must match the definition card with one of the word cards in his or her hand. If this cannot be done, the card is returned to the bottom of the pile. If the card can be matched, a "book" is made and the matching cards are placed on the table in front of the player. The WINNER is the first player to match all of the cards.

ALTERNATIVE:

One -half of the cards may have drawings or pictures related to the subject and the matching half may contain phrases or sentences which are related to the pictures.

SKILL: Vocabulary - Word Meaning

MATERIALS: 3 x 5 cards (2 cards per word) scissors, glue

TEACHER DIRECTIONS: MATCHING CARDS GAME

Divide the students into groups of 4 to 8. Assign or have students think of a word or phrase that pertains to the subject and write it on one card. Then draw or find an illustration of the word or phrase on another card. Collect the cards into two separate decks (i.e. phrase deck and picture deck) and shuffle each deck. Each student is dealt a card from each deck. The students then try to be the first to match their cards correctly. The players decide by vote if the cards match. This encourages discussion about word meaning and interpretations.

ALTERNATIVES: The teacher may select the words and pictures, but that deprives the students of an opportunity to think creatively.

Each author holds on to his phrase card. The picture cards are called and are distributed so that no one has his own. The phrase author holds up his card and the others try to match their pictures to it. When the correct picture is matched the two explain how they came to their decision. Continue around the circle until all are matched.

SKILL: Vocabulary - Spelling

MATERIALS: Science word list

TEACHER DIRECTIONS:

Divide the class into two teams. A player may choose a word from a five cent, fifteen cent or twenty-five cent category. Words are grouped in categories of difficulty from five to twenty-five cents. Add the value of a correct word to the team's score. If a player misspells a word, it is not necessary to sit down, but the team does not add that word's value to its final total.

SAMPLE ITEM:

Spelling Money Bank

5¢	10¢	25¢
matter	environment	kinetic
color	relative	spectrum
rate	mixture	atmosphere
flow	fission	molecule
motion	formula	analyze
clue	formation	chemically
gas	data	apparatus
atom	astronomer	phenomena

SPELLING

SKILL: Vocabulary - Spelling

MATERIALS: None

TEACHER DIRECTIONS:

Players sit in a semicircle and one person begins the game with a letter (the person should have a word used in the field of science in mind). The next person in the circle adds a letter, as does the next, and so on. The player who ends a word subtracts a point. The lowest score wins.

SKILL: Vocabulary - Spelling

MATERIALS: Several science spelling lists

TEACHER DIRECTIONS:

Students are divided into two teams and line up in rows. A leader is appointed in each row. Each leader pronounces the first word from the test. The first player in each row (not the leader) uses the chalkboard and writes the word as quickly as possible. If the word is misspelled, the next player in the row must correct it. If that player also misses it, the next player in the row must correct it. This continues until the word is spelled correctly. The team that completes the list is the winner.

SKILL: Vocabulary - Syllabication

MATERIALS: Textbook, teacher-made exercise

TEACHER DIRECTIONS:

Compile a list of words from the textbook assignment or the unit being taught. Read the words aloud and have students indicate by a numerical symbol how many syllables are found in the word.

SAMPLE ITEM: Concepts in Science - 6

Unit Seven - Harvesting the Atom.

Teacher's List	Student's List
1. chemically	1. 4
2. hydrogen	2. 3
3. oxygen	3. 3
4. molecule	4. 3
5. atom	5. 2
6. nuclei	6. 3
7. apparatus	7. 4
8. investigation	8. 5
9. opposite	9. 3
10. combination	10. 4

Text: Concepts in Science, 271 - 321

SYLLABICATION

SKILL: Vocabulary - Syllabication

MATERIALS: Textbook, teacher-made exercise

TEACHER DIRECTIONS:

Compile a list of words from the textbook assignment or the unit being studied. Have students write the syllable parts of each word on spaces provided.

SAMPLE ITEM: Concepts in Science - 6

Unit Eight - Probing the Stars

DIRECTIONS: Write the syllable parts of each word in the spaces provided.

1. radiation _____ _____ _____ _____
2. atmosphere _____ _____ _____
3. phenomena _____ _____ _____ _____
4. observatory _____ _____ _____ _____ _____
5. scientist _____ _____ _____
6. astronomer _____ _____ _____ _____
7. predicting _____ _____ _____
8. data _____ _____
9. universe _____ _____ _____
10. electron _____ _____ _____

Text: Concepts in Science, 323 - 359

SYLLABICATION

SKILL: Vocabulary - Syllabication

MATERIALS: Textbook or other instructional material, teacher-constructed worksheet

TEACHER DIRECTIONS:

The teacher selects words from a given textbook or chapter. Each word is divided into syllables. The syllables in each word are scrambled. The student is asked to unscramble the syllables and make a word.

SAMPLE ITEM:

DIRECTIONS: Unscramble the syllables to make a word. Write the word in the space provided.

1. tory a serv ob _____
2. ac tion re _____
3. dro hy gen _____
4. o bry em _____

ALTERNATIVE:

The syllables of a word can be printed on cards of the same color. The student is asked to arrange the cards to make a word and then write the word on paper. Sets of syllable words may be kept in envelopes for use at learning stations.

SYLLABICATION

SKILL: Vocabulary - Syllabication

MATERIALS: Textbook, teacher-made exercise

TEACHER DIRECTIONS:

Take a paragraph or more from the textbook assignment and leave out the syllables in some of the words. Have students add the missing syllables using the book first and then without the book when they feel confident enough.

SAMPLE ITEM:

Concepts in Science - 6

Unit Eight - Probing the Stars

Chapter 2. Energy from the Sun, p. 329

"Where does the Sun get its en__gy? You can get some clues by study___ the make-up of the Sun. When sci___tists do so, they find that the Sun is made up mainly of the ___es __drogen and hel___. In fact about 97 per____ of the Sun is made up of these two gases. The rest of the ___ter of the Sun is made up of other ___oms. But these atoms are not in the same state as they are on Earth. "

Text: Concepts in Science, p 329

SYLLABICATION

SKILL: Vocabulary - Syllabication

MATERIALS: Instructional material, word list, teacher-made exercise

TEACHER DIRECTIONS:

Compile a list of words from the unit being studied. Have students write the syllable parts of each word on spaces provided.

SAMPLE ITEM:

DIRECTIONS: Write the syllable parts of each word on the spaces provided.

1. gravitation _____ _____ _____ _____
2. inertia _____ _____ _____ _____
3. satellite _____ _____ _____
4. orbit _____ _____
5. energy _____ _____ _____
6. rotation _____ _____ _____
7. galaxy _____ _____ _____
8. thrust _____
9. mass _____
10. protoplanet _____ _____ _____ _____

SYLLABICATION

SKILL: Vocabulary - Prefixes

MATERIALS: Instructional materials, teacher-made exercise, (Refer to "Dictionary of Word Parts" on pages 97 - 106)

TEACHER DIRECTIONS:

Compile a list of words from the instructional materials for a unit of study which contains prefixes. Help students to decipher meaning by using prefix clues in vocabulary development.

SAMPLE ITEM:

DIRECTIONS: Fill in the blanks using your knowledge of prefixes.

1. A star which transmits energy sends it _____ the universe.
2. When something explodes it bursts from the inside ___ _____.
3. If an astronomer predicts the end of a planet, he has announced his knowledge of it _____ it happens.
4. If a physicist tells about the circumstances of a comet's arrival, he must know about all the facts, events and influences _____ it that caused this to happen.
5. To remember a fact you must bring it from memory or think about it _____.

SKILL: Vocabulary - Prefixes

MATERIALS: Textbook or other instructional materials, (Refer to "Dictionary of Word Parts pages 97 - 106)

TEACHER DIRECTIONS:

Compile several sentences from the textbook assignment or other instructional materials which contain prefixes and develop exercises to help students use prefix clues in deciphering meaning.

SAMPLE ITEM: Concepts in Science - 6

Unit Eight - Probing the Stars

DIRECTIONS: Read the sentences below. Using your knowledge of prefixes, choose the correct response to the question given.

(p. 346) 1. "When most of the original hydrogen in the star has been used up, the star explodes.

1Q. Which is the true statement about the star?

a. It has not changed.

b. It gets denser because all of the elements come closer together.

c. Its particles shoot out across space.

(p. 334) 2. "Our star, the sun, is a kind of longlasting nuclear reactor."

2Q. Which is the true statement about the sun?

a. It does certain things again and again.

b. It does certain things before it is expected.

c. It does certain things after it is supposed to.

Text: Concepts in Science, pp. 346, 334

PREFIXES

(p. 334) 3. By analyzing the spectrum of a star, astronomers can tell what its surface temperature is.

3Q. Which is the true statement?

a. by looking at the spectrum all at once.

b. by looking at the separate parts of the spectrum.

c. by lying again about the spectrum.

(p. 346) 4. "When most of the original hydrogen in the star has been used up, the star explodes. It flares up with a great and brilliant light. It becomes a nova. It may even become a supernova."

a. smaller nova.

b. a more distant nova.

c. a greater, extremely brilliant nova.

Text: Concepts in Science, pp. 334, 336

PREFIXES

SKILLS: Vocabulary - Prefixes

MATERIALS: (Refer to "Dictionary of Word Parts" on pages 97 - 106)

TEACHER DIRECTIONS:

Compile a list of words from the textbook (or other) assignment or unit of study which contain prefixes. Help students to decipher meaning by using prefix clues in vocabulary assignments.

SAMPLE ITEM:

DIRECTIONS: Using your Dictionary of Word Parts fill in the blanks.

1. Observatory has the prefix _____ which means _____.

   Observatory means _____.

2. Transmit has the prefix _____ which means _____.

   Transmit means _____.

3. Combination has the prefix _____ which means _____.

   Combination means _____.

4. Compound has the prefix _____ which means _____.

   Compound means _____.

5. Dilute has the prefix _____ which means _____.

   Dilute means _____.

6. Collect has the prefix _____ which means _____.

   Collect means _____.

PREFIXES

7. Substance has the prefix _____ which means_____.

   Substance means_____.

8. Examination has the prefix _____ which means_____.

   Examination means_____.

9. Produce has the prefix_____ which means_____.

   Produce means _____.

10. Subtract has the prefix _____ which means_____.

    Subtract means_____.

PREFIXES

SKILL: Vocabulary - Suffixes

MATERIALS: Textbook or other instructional materials, teacher-made exercise, (Refer to "Dictionary of Word Parts" on pages 97 - 106)

TEACHER DIRECTIONS:

Compile a list of suffixes from the textbook assignment or unit of study. Help students to decipher meaning of words by using suffix clues in vocabulary development.

SAMPLE ITEM:

Concepts in Science - 6

Unit Eight - Probing the Stars

DIRECTIONS: Using your Dictionary of Word Parts, connect the suffix to its proper meaning.

1.	chemically	a.	state, process of being
2.	examination	b.	diminutive
3.	observatory	c.	occupation, doer
4.	scientist	d.	pertaining to
5.	volcanic	e.	resembling, characteristic of
6.	frequency	f.	of, like, pertaining to
7.	circumstance		
8.	particle		
9.	astronomer		
10.	environment		

Text: Concepts in Science, 323 - 359

SUFFIXES

SKILL: Vocabulary - Suffixes

MATERIALS: Textbook, teacher-made exercise, (Refer to "Dictionary of Word Parts" on pages 97 - 106)

TEACHER DIRECTIONS:

Compile a list of words from the textbook assignment which contain suffixes and develop an exercise which helps students to use suffix clues in vocabulary development.

SAMPLE ITEM:

Concepts in Science - 6

Unit Eight - Probing the Stars

DIRECTIONS: After reading the examples write the meaning of the words which follow.

SUFFIXES
The meaning of some suffixes is obvious, e.g.,

careful, full of care

Some suffixes mean state of or act of being:

ex. investigation state of looking into

ex. curiosity state of being curious, wanting to know

radiation _____

combination _____

formation _____

reaction _____

fusion _____

fission _____

examination _____

information _____

Text: Concepts in Science, pp 323 - 359

SUFFIXES

constellation _____

motion _____

illustration _____

section _____

gravitation _____

eruption _____

environment _____

frequency _____

Some suffixes indicate what a thing is or is doing:

ex. violent is doing something dangerously reactive

different _____

abundant _____

distance _____

circumstance _____

Many suffixes indicate who a person is, what he is:

ex. astronomer one who studies stars

physicist _____

reactor _____

steelworker _____

(continued)

Some suffixes mean place of:

ex: observatory ___a place to observe stars_____

factory _____

laboratory_____

Some suffixes mean resembling or characterized by:

ex: electric ___characterized by electricity_____

volcanic _____

sulfuric _____

electronic_____

dramatic_____

SUFFIXES

SKILL: Vocabulary - Suffixes

MATERIALS: Textbook or other instructional material, teacher-made exercise, (Refer to "Dictionary of Word Parts" on pages 97 - 106)

TEACHER DIRECTIONS:

Compile a list of words from the class assignment which contains suffixes. Help students to decipher meanings by using suffix clues in vocabulary development.

SAMPLE ITEM:

Concepts in Science - 6

Unit Eight - Probing the Stars

DIRECTIONS: Select from the following list the words whose suffixes have the meaning given below. Define the word by completing the line. Use your Dictionary of Word Parts when necessary.

reactor	factory	physicist
definitely		careful

1. _____ in the state of _____
2. _____ a place where _____
3. _____ a thing or person who _____
4. _____ full of _____
5. _____ in a _____ manner

Text: Concepts in Science, pp 323 - 359

SUFFIXES

SKILL: Vocabulary - Suffixes

MATERIALS: Textbook or other instructional materials, teacher-made exercises, (Refer to "Dictionary of Word Part" on pages 97 - 106)

TEACHER DIRECTIONS:

Compile a list of suffixes from the textbook assignment or other instructional unit. Help students to decipher meaning of words by using suffix clues in vocabulary development.

SAMPLE ITEM

Concepts in Science - 6

Unit Eight - Probing the Stars

DIRECTIONS: Create a new word by adding suffixes to the following:

1. physics + ist = _____
2. inform + tion = _____
3. examine + tion = _____
4. relate + ive = _____
5. sulfur + ic = _____
6. react + tion = _____
7. fuse + tion = _____
8. electricity + ic = _____
9. part + cle = _____
10. volcano + ic = _____

CAUTION: Some words will need a change in spelling.

Text: Concepts in Science, pp. 323 - 359

SKILL: Vocabulary - Suffixes

MATERIALS: Textbook, teacher-made exercises, (Refer to "Dictionary of Word Parts" on pages 97 - 106)

TEACHER DIRECTIONS:

Develop an exercise from the textbook assignment to help students decipher meaning by using suffix clues in vocabulary development.

SAMPLE ITEM:

Concepts in Science - 6

Unit Eight - Probing the Stars

DIRECTIONS: In the following passage you will find words which contain these suffixes: -est, -ism, -um, -er, ists. Underline these words.

"Astronomers can find out the temperature of a star by finding out its color. They can also find out the temperature of a star by looking at the spectrum of the light from the star. Astronomers do this with the help of a spectroscope, an instrument for examining light.

The main part of the spectroscope is really the prism. The prism separates light into bands of colors, a spectrum. Notice that white light entering the spectroscope has been separated into bands of colors.

Have you ever noticed that stars are not all the same color? A star may be red, yellow, white, even blue-white--or something in between. If you suspect that red stars are coolest and blue-white stars are hottest, you are right. If you look at the spectra of stars of various colors. you will see that the spectra differ. By measuring the band where a star's spectrum has the most energy, scientists can calculate the star's surface temperature."

Text: Concepts in Science, pp. 334 - 335

SUFFIXES

SKILL: Vocabulary - Synonym

MATERIALS: Textbook or other instructional materials, teacher-made exercise

TEACHER DIRECTIONS:

Develop an exercise from the textbook assignment or unit of study to help students expand their vocabulary through the study of synonyms.

SAMPLE ITEM:

DIRECTIONS: Find the two words in each row that are most nearly alike in meaning. Circle the two words.

1.	air	water	atmosphere	soil
2.	opposite	same	near	unlike
3.	get	send	transmit	follow
4.	compound	mixture	cell	weight
5.	gas	liquor	water	liquid
6.	splitting	fusion	fission	vision
7.	analyze	put together	carry away	take apart
8.	color	spectrum	vision	taste
9.	lesson	tool	instrument	trumpet
10.	fire	flame	game	gas

SYNONYMS

SKILL: Vocabulary - Synonyms

MATERIALS: Textbook or other instructional materials, teacher-made exercise

TEACHER DIRECTIONS:

Develop an exercise from the textbook assignment or unit of study. Help students expand their vocabulary through the study of synonyms.

SAMPLE ITEM: Word Scramble

DIRECTIONS: Unscramble the words given to find two words that are alike in meaning.

1. ria _____
   epshamtoer _____

2. popsoeit _____
   eulinkei _____

3. rsatntim _____
   dsne _____

4. exmtiur _____
   pcomnudo _____

5. qluiid _____
   rwtae _____

6. sniiofs _____
   gnlsitipt _____

7. atke tpraa _____
   zynalae _____

8. mspetcru _____
   olcro _____

9. tnistrnume _____
   otol _____

10. efalm _____
    rife _____

SYNONYMS

SKILL: Vocabulary - Synonyms

MATERIALS: Textbook or other instructional materials, teacher-made exercise

TEACHER DIRECTIONS:

Develop an exercise from the class assignment to help students expand their vocabulary through the study of synonyms.

SAMPLE ITEM: Concepts in Science - 6

Unit Eight - Probing the Stars

DIRECTIONS: Choose the synonym for each of the following words listed below:

1. constellation _____
2. current _____
3. environment _____
4. fission _____
5. frequently _____
6. compound _____
7. fusion _____
8. kinetic _____
9. matter _____
10. spectrum _____

difference	surroundings	mixture	flow
rate	relative	stars	splitting
molecule	moving, motion	substance	combining
analyze	supernova	formation	color

Text: Concepts in Science, 323 - 359

SYNONYMS

SKILL: Vocabulary - Context Clues

MATERIALS: Textbook or other instructional materials, teacher-made exercise

TEACHER DIRECTIONS:

Select or write a paragraph or several paragraphs about a unit being studied and create exercises for using the context. This exercise may be used as an introduction to a new study.

SAMPLE ITEM:

DIRECTIONS: Fill in the blanks with the correct answer from those listed below.

Before our scientists broke the 1) _____ of our atmosphere, our 2) _____ of the sun was 3) _____. The atmosphere stops most of the radiant 4) _____ of the sun. An 5) _____ outside the atmosphere--perhaps on the moon, would assist us in learning the how, when and why of the sun's phenomena.

1. a) barrier	b) prism	c) mist
2. a) belief	b) knowledge	c) awareness
3. a) expansive	b) great	c) limited
4. a) matter	b) oxygen	c) energy
5. a) ocean	b) tower	c) observatory

CONTEXT CLUES

SKILL: Vocabulary - Context Clues

MATERIALS: Textbook or other instructional material, teacher-made exercise

TEACHER DIRECTIONS:

Using words taken from the unit of study, create an exercise to assist students in deciphering word meaning through the use of context clues.

SAMPLE ITEM:

DIRECTIONS: Select the word that belongs in the blanks from those definitions listed below.

1. The sun gives off energy from the _____of hydrogen into helium.
2. The sun's heat energy _____water that later forms clouds and then comes down as rain.
3. The sun's energy is produced because small amounts of the sun's _____ are constantly being changed into energy.
4. Light from an object that scientists wish to analyze is broken up by a _____.
5. The Milky Way _____ is made up of all the stars in the group of which our sun is a part.

a. evaporates - the change from a solid or a liquid to a gas

b. galaxy - a large group, or system, of stars which is rotating around a center

c. fusion - the combining of atomic nuclei of one element, resulting in the nucleus of another

d. matter - all substances on the earth or in space or any part of them; anything that has weight and takes up space

e. prism - a device, such as a triangular piece of glass that separates light into its different wavelengths, visible as a spectrum

CONTEXT CLUES

SKILL: Vocabulary - Context Clues

MATERIALS: Textbook, 24" by 3" strips of construction paper, one black marking pencil, one red marking pencil

TEACHER DIRECTIONS:

The teacher selects sentences from the textbook which contain words with which students are expected to become familiar. Each sentence is printed on a strip of paper. The word to be learned is printed in red. The students are asked to figure out the meaning of the word by using the other words in the sentence as clues.

SAMPLE ITEM: "Energy released by nuclear fission is far greater than energy released by chemical change, such as the burning of fuels. Our new concept of the atom as divisible makes it possible for us to control this vast energy from fission for our own uses.

So you have come to a deeper understanding of a major concept of matter and energy:

MATTER CAN BE CHANGED INTO ENERGY, BUT THE TOTAL SUM OF MATTER AND ENERGY REMAINS THE SAME.

This concept is sometimes called the concept of Conservation of Matter-Energy."

ALTERNATIVE:

Lessons of this type can be produced in worksheet format.

Text: Concepts in Science. p 316

CONTEXT CLUES

SKILL: Vocabulary - Words in Context and Sentence Building

MATERIALS: Index cards (3" x 5" one side lined, plain); felt-tipped pen; dice; Magic Markers - red, yellow, and blue; paper and pencil for each player; selected vocabulary list containing nouns, verbs, and modifiers; approximately 20 each (for two players)

TEACHER DIRECTIONS: (1) Mark across corner (lined side) an even number of cards - red, yellow and blue. red = verbs; blue = nouns; yellow = modifiers. (At least 20 cards for each color)
(2) On plain side of card, using felt-tipped marker, place nouns, verbs, and modifiers according to color card. Note: All words should come from a related vocabulary list. See sample list that follows.

HOW THE GAME IS PLAYED

Sentence Mate

To begin the game, all blue, red, and yellow cards are placed, word side down (color side up) in the center of the table in their respective piles. First player throws dice and may pick up the number of cards indicated by the number on the dice. Any combination of colors may be chosen as long as the correct total number of cards are chosen. Each player proceeds in turn until one of the players has enough cards to make a sentence. Only one card of each color is required to make a sentence. Players may hold cards as long as they choose before making a sentence. Players may, when it is their turn, exchange a card from their hand for a card from the table if they prefer. (Always a card of the same color must be exchanged) The object of the game is to make a sentence from the cards selected. The sentence is written on the player's paper. The player with the most words used in sentences when the last card is pulled from the deck WINS THE GAME!!!

CONTEXT CLUES

SAMPLE
ITEM:

Sentence Mate

blue (B) NOUNS	(red) (R) VERBS	(yellow) (Y) MODIFIERS
1. heat	1. launch	1. intense
2. ramjet	2. carry	2. fast
3. speed	3. flow	3. hot
4. direction	4. expand	4. opposite
5. fuel	5. requires	5. tremendous
6. nozzle	6. needs	6. additional
7. gases	7. turn	7. increased
8. combustion	8. push	8. expanding
9. power	9. mix	9. compressed
10. particles	10. produce	10. high
11. temperature	11. guide	11. first
12. chamber	12. regulate	12. ordinary

By using 3 (Y), 7 (B), 3 (R), 6 (B), 5 (Y), and 3 (B), the following sentence is constructed.

Hot gases flow from the exhaust nozzle at tremendous speeds.

CONTEXT
CLUES

SKILL: Vocabulary - Categorizing

MATERIALS: Textbook or other instructional material, paper and pencil, word list

TEACHER DIRECTIONS:

Arrange words from word list in categories. Add one word that is "science related" but does not belong to the specific category involved. Instruct the student to cross out the word that does not belong in each group or category.

SAMPLE ITEM:

1. aphids weevils potato bugs ants cutworms
2. rabbit mouse beaver lamb squirrel
3. ant roach fly mosquito spider
4. ostrich chicken kiwi heron emu
5. goat kitten colt puppy lamb

ANSWER KEY: Words that should be crossed out are as follows:

1. potato bugs
2. lamb
3. spider
4. heron
5. goat

ALTERNATIVES:

Extra credit may be given to the student who can add a word (not included in the teacher's list) that belongs to one of the given categories.

SKILL: Vocabulary - Categorizing

MATERIALS: Textbook or other instructional materials, teacher-made worksheet

TEACHER DIRECTIONS:

The teacher selects categories that are related to a unit of study and develops a worksheet according to the format in the Sample Item. The students are asked to fill in the blanks. This can be an untimed or timed activity.

SAMPLE ITEM:

Category	N	S	B	A	P	Total Points
Kinds of Scientists			biologist	astronomer	physicist	3
Parts of matter	neutron			atom	proton	3
Galactic Bodies	nova	supernova		asteroid	planet	4
Planets	Neptune	Saturn			Pluto	3 / 13

ALTERNATIVES:

1. Students can be given blank charts to create their own categories.
2. Completed charts can be used to introduce simple outlines by having the students arrange the words in outline form.
3. Scanning techniques can be reviewed by having students use their textbook in order to complete the chart.

SKILL: Vocabulary - Multiple Meaning

MATERIALS: Vocabulary words used in science that also have other meanings

TEACHER DIRECTIONS:

List words found in science that often have other meanings. Have students match each word with the appropriate meaning.

SAMPLE ITEM:

organ	mold	automatic
shoot	bean	energy
cell	graft	compound
culture	colony	

1. _____ a type of behavior that does not require thought.
2. _____ the smallest living unit of structure and function in an organism.
3. _____ a visible group of bacteria originating from division of a single cell.
4. _____ a substance consisting of two or more kinds of atoms chemically combined.
5. _____ a colony of bacteria grown under controlled conditions.
6. _____ the ability to do work, the ability to set matter in motion.
7. _____ to join the stem of one plant to the root or stem of a related plant.
8. _____ a young growth or shoot on a plant.
9. _____ a ray of light.
10. _____ a group of tissues that carries on a specialized function in an organism.
11. _____ a fungus that grows on a plant or animal matter.

MULTIPLE MEANING

COMPREHENSION

ACTIVITIES

SKILL: Comprehension - Main Idea

MATERIALS: Textbook or other instructional materials

TEACHER DIRECTIONS:

Select a paragraph or paragraphs from the science textbook and construct multiple choice statements pertaining to the material. One of the items should state the main idea.

SAMPLE ITEM:

DIRECTIONS: Read the following paragraphs and choose from the items below the statement which best expresses the Main Idea of the paragraphs.

"People once thought that everything in the universe remained pretty much the same. Now we know that things are not always what they seem. We do not feel that the Earth is moving, for example. Yet we know that the Earth is moving. It is rotating. It is also revolving around the Sun."

"The Moon revolves around the Earth. The Earth revolves around our star, the Sun. And the Sun itself is moving. All the billions of stars in our galaxy are moving. And all the millions of galaxies in the Universe are moving."

"The Universe is vast, and there is much in it that we do not yet understand. But we do understand that all things in the Universe are in motion."

Multiple Choice Statements

1. Things are not always what they seem.
2. We do not feel the earth is moving.
3. All things in the Universe are in motion.
4. All stars are moving.

Text: Concepts in Science, p. 355.

MAIN IDEA

SKILL: Comprehension - Main Idea

MATERIALS: Textbook or other instructional materials of varying levels or take a paragraph from the science text in use, 5 X 8 cards

TEACHER DIRECTIONS:

Teacher writes out each paragraph on index cards. The students are asked to write a title for each paragraph.

SAMPLE ITEM:

DIRECTIONS: After reading the paragraph, write a title that tells about it.

"Our understanding that matter can be changed to energy helps us to explain how the Sun radiates light and energy. We know that on the Sun, matter is changed to energy. Indeed the experiments of scientists have told us:

Energy can be changed into other forms of energy.
Matter can be changed into other forms of matter.
Matter can be changed into energy. However, the total amount of matter and energy remains the same."

Text: Concepts in Science, pp. 356 - 357

MAIN IDEA

SKILL: Comprehension - Main Idea

MATERIALS: Magazine or textbook pictures, tagboard, glue

TEACHER DIRECTIONS:

The teacher selects pictures which are mounted on tagboard or construction paper. The students are asked to write a title for each picture.

SAMPLE ITEM:

DIRECTIONS: Think of and write a title for each picture.

MAIN IDEA

SKILL: Comprehension - Details

MATERIALS Textbook or other instructional materials, 3X5 cards.

TEACHER DIRECTIONS:

The teacher selects 4 - 6 paragraphs related to a science unit. The main idea of each paragraph is typed on a colored card. The remaining sentences from each paragraph are typed on cards of another color. All of the cards are shuffled. The students are asked to match each sentence with the correct main idea.

SAMPLE ITEM:

1. Living things are dependent on their environment.
2. Humans, as scientists, have learned to observe and to investigate their environment.

****

Cattle cannot live without grass.

Grass cannot live without other organisms

They search for relationships which help us to understand our environment.

From relationships, humans develop concepts which help us to understand our environment.

They depend on and use light energy from the sun, 93,000,000 miles away, to make their food.

They are always looking for new and better ideas to create.

SKILL: Comprehension - Locating the Facts

MATERIALS: Textbook or instructional materials and teacher-made questions

TEACHER DIRECTIONS:

Questions are listed before the story or passage is read. The students locate the information needed to answer the questions as they read.

SAMPLE ITEM:

DIRECTIONS: Look for the answers to these questions as you read the following selection.

1. What kind of bacteria is helpful?
2. Of what use is decay bacteria?
3. What would happen without decay bacteria?

"Bacteria are found almost everywhere, in air and water and soil. Invisible though they are to the unaided eye, they are very important. In the soil they help fertilize plants. They cause decay of dead plants and animals. They are useful in industry for instance, in the making of cheese. There are many highly useful bacteria. But there are harmful bacteria, too. They cause the spoilage and loss of vast amounts of food. They are the cause of many serious diseases."

Text: Concepts in Science, pp. 91 - 92

LOCATING
THE FACTS

SKILL: Comprehension - Sequence

MATERIALS: Textbook or other instructional materials, construction paper.

TEACHER DIRECTIONS:

Select a short paragraph from the text and put each sentence on a strip of construction paper. Mix the strips in a box. Each student or group of students must arrange the strips in order. Compare results with the original paragraph. Discuss the differences between the author's paragraph and the group paragraph.

Key words to assist students in determining the sequence of events are:

first	as a result	after that
then	finally	and then
next	when	at least
in the meantime	while	

SAMPLE ITEM:

DIRECTIONS: Organize the sentences into a complete paragraph.

This energy can be sent through a wire to a distant place before you can blink.

Radio and television change sound energy and light energy into the energy of electromagnetic waves, and back again.

Then the electric energy is changed into sound energy again.

The telephone changes the energy of sound waves into electric energy.

Text: Concepts in Science, p. 263

SEQUENCE

SKILL: Comprehension - Inferences

MATERIALS: 24" x 18" sheet of tagboard or construction paper, magazines and newspaper clippings, glue, 24" x 3" strips of construction paper.

TEACHER DIRECTIONS:

The teacher identifies a concept to be taught (i.e., Living things are dependent on their environment.) Pictures are then selected which substantiate the concept. These are glued on the tagboard sheet.

Students are assigned to teams of 4 - 5 . Each team is given a tagboard concept sheet. The team is asked to think of a title and a statement about the concept sheet. The statement is printed on the strip of construction paper. The concept sheet and statement about it are displayed in the classroom in order to reinforce the concept.

SKILL: Comprehension - Inferences

MATERIALS: Magazine advertisements

TEACHER DIRECTIONS:

Display five advertisements. Have students list five facts and five opinions about each.

SAMPLE ITEM:

Protein Enriched
Buy Health Food
Builds Bodies in 25 Ways
Inexpensive
Delicious
45¢

FACT	OPINION
1. Has protein	1. Good for you
2. Lists ingredients	2. Builds bodies in 25 ways
3. 45¢	3. Inexpensive
	4. Delicious

ALTERNATIVES:

Have students read orally advertisements from which they have deleted all opinion.

INFERENCES

SKILL: Comprehension - Inferences

MATERIALS: Teacher-constructed questions, paragraph from science text or other instructional material

TEACHER DIRECTIONS:

Ask students to read paragraph and answer questions or draw conclusions based on what they have read.

SAMPLE ITEM:

Between 1650 and 1750 more than sixty million people died of smallpox in Europe. The virus was spread by contact with a person suffering from the disease. This disease is extremely contagious.

In 1947, a man left Mexico for a bus trip to New York. He became ill while on the way. When he had reached New York, it was found he had small pox.

A great many people had been exposed to smallpox as this man travelled across the country from Mexico to New York. Soon, more cases of smallpox were reported here and there. The news was flashed over radios and in newspapers. People were urged to have themselves vaccinated. Thousands stood in line at doctors' offices to get vaccinations.

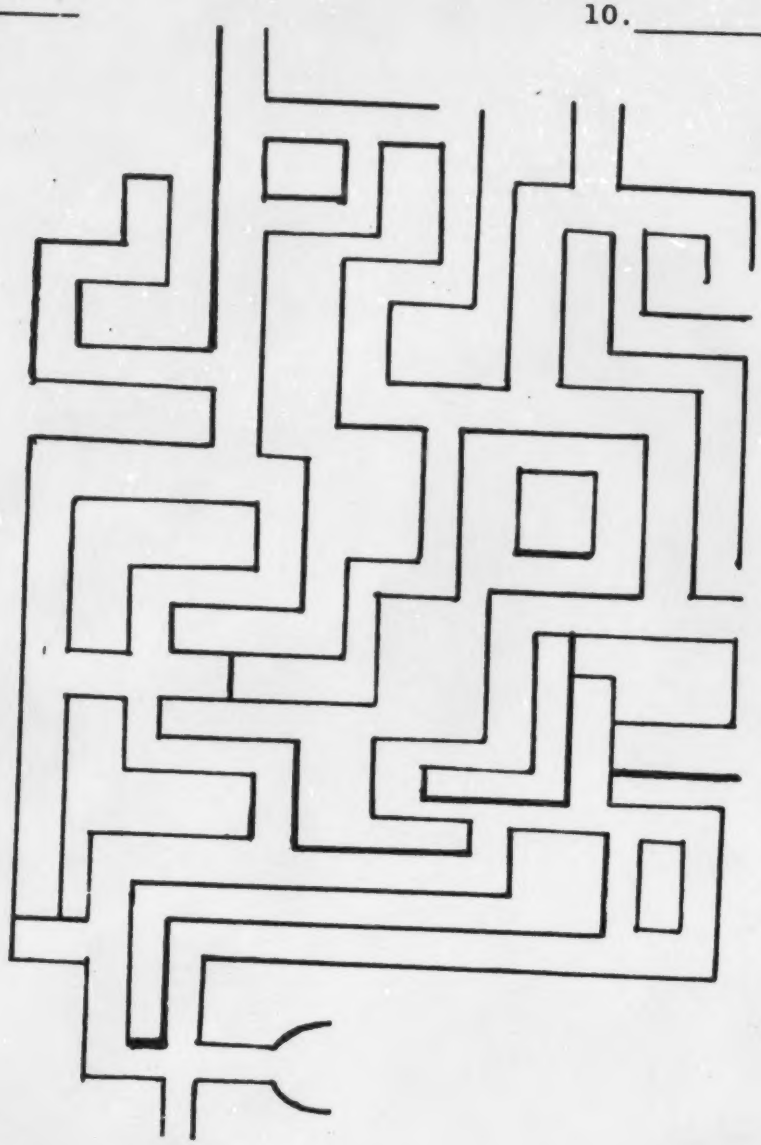
****

Judging from what you have read, would you conclude that we probably had a smallpox epidemic in our country in 1947? Why or Why not?

APPENDICES

WORD MAZE MASTER

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

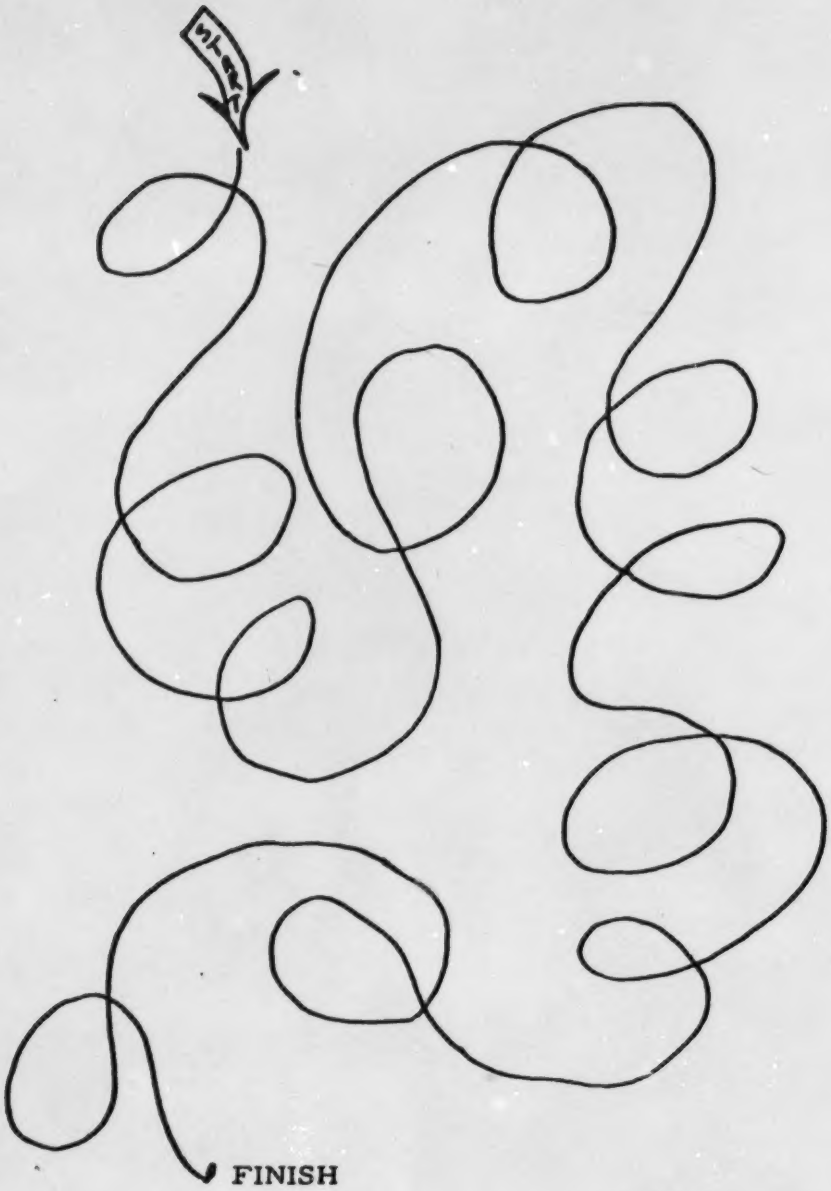


NAME _____

DATE _____

Reference: p. 36.

WORD TWIRL



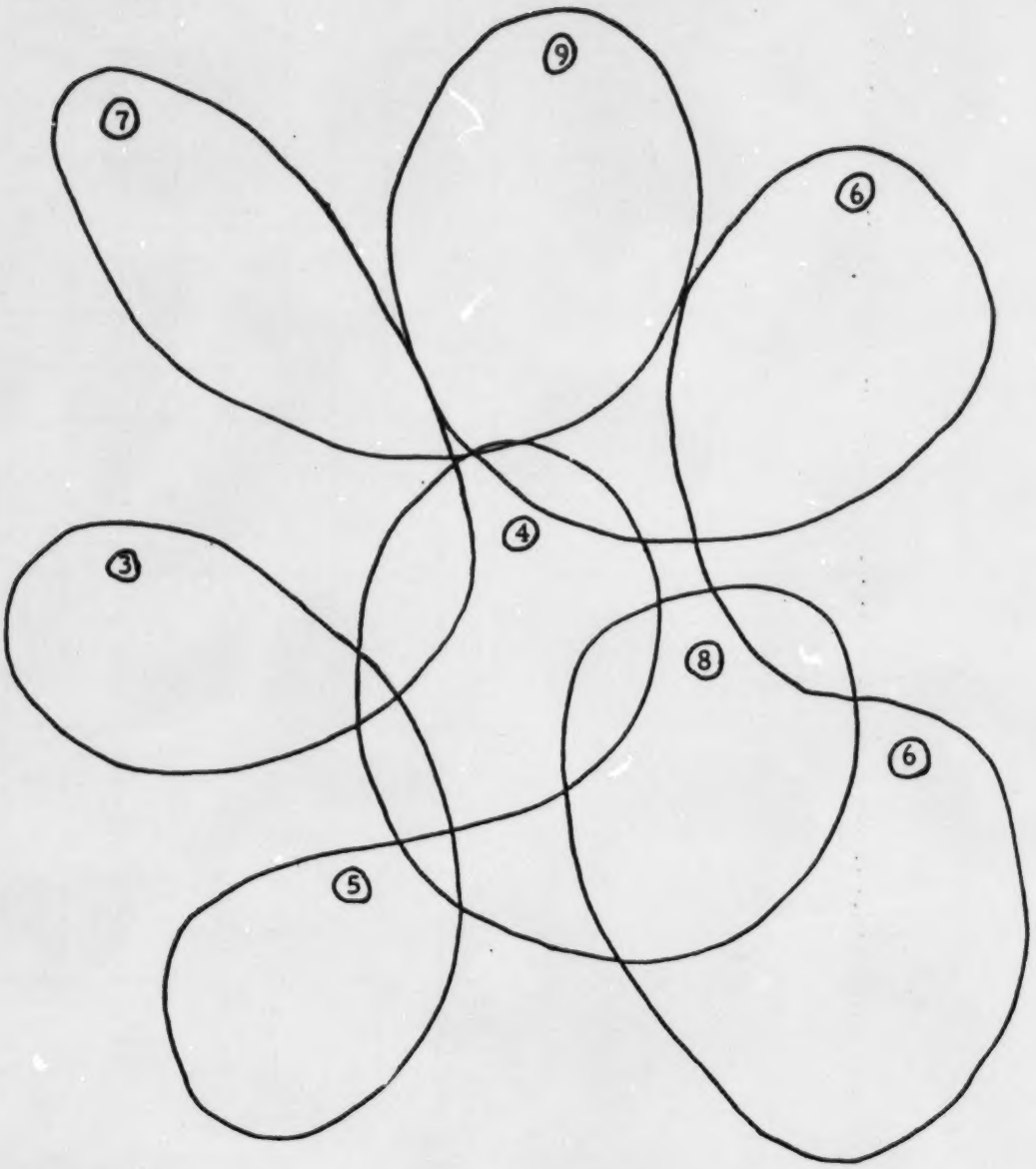
Subject_____

Name_____ Date_____

Reference: p. 37

WORD TWIRL
MASTER

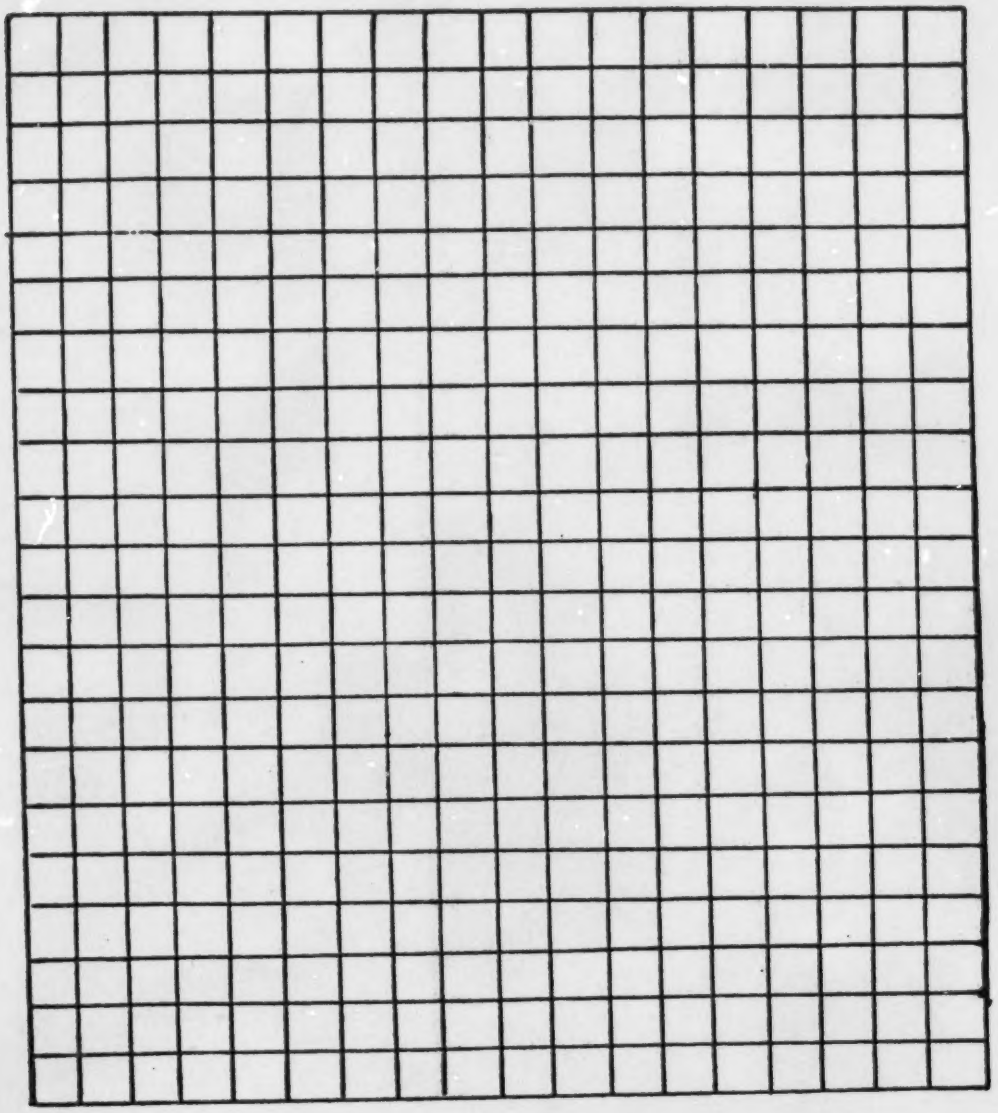
ADD-UP-THE-WORDS



Reference: p. 38

ADD-UP-THE-WORDS
MASTER

SEEK AND FIND



Subject_____ Name_____

Date_____

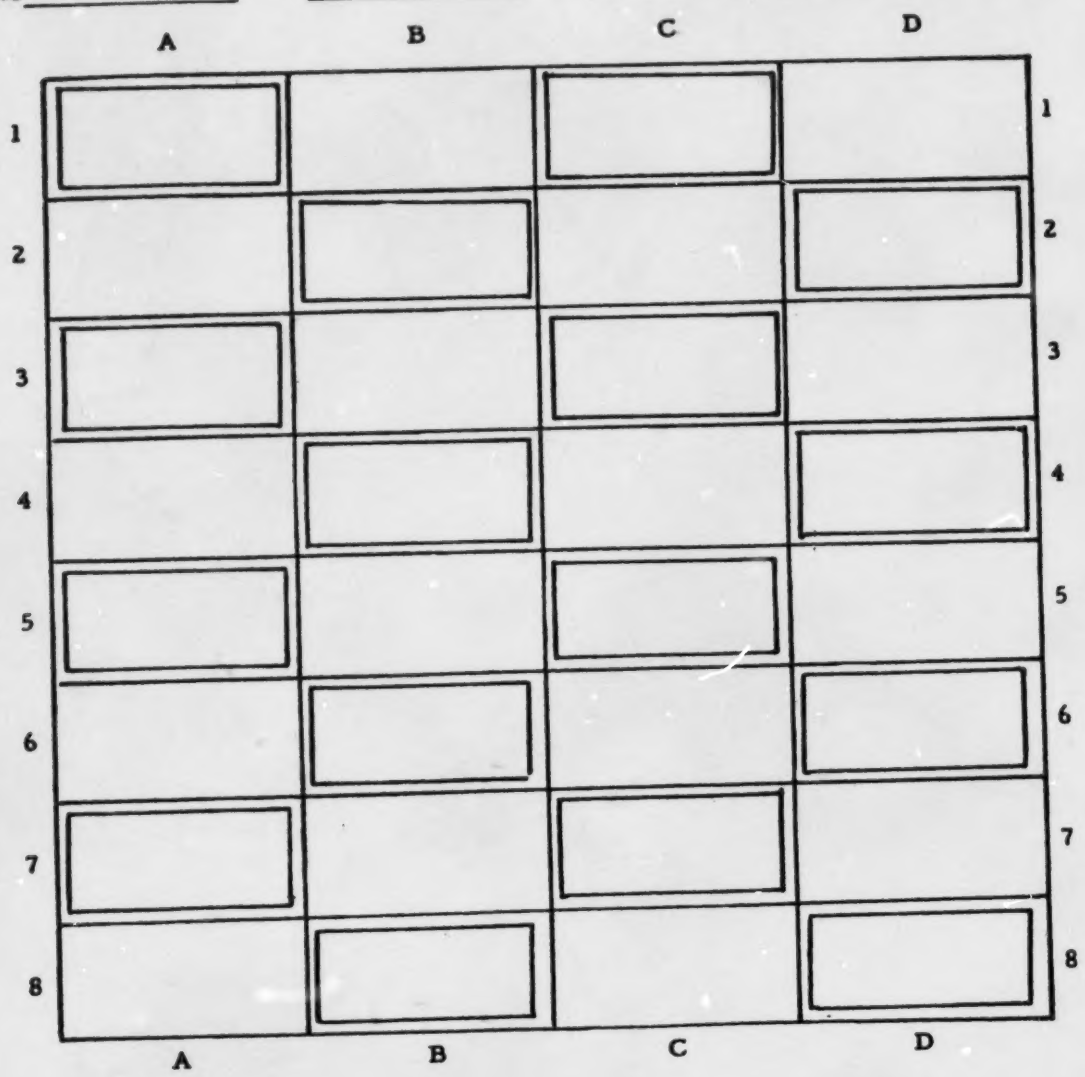
SEEK AND FIND
MASTER

Reference: pp. 39, 40

MATCHING SPACES

A1_____ B2_____ C1_____ D2_____

A3_____ B4_____ C3_____ D4_____



A5_____ B6_____ C5_____ D6_____

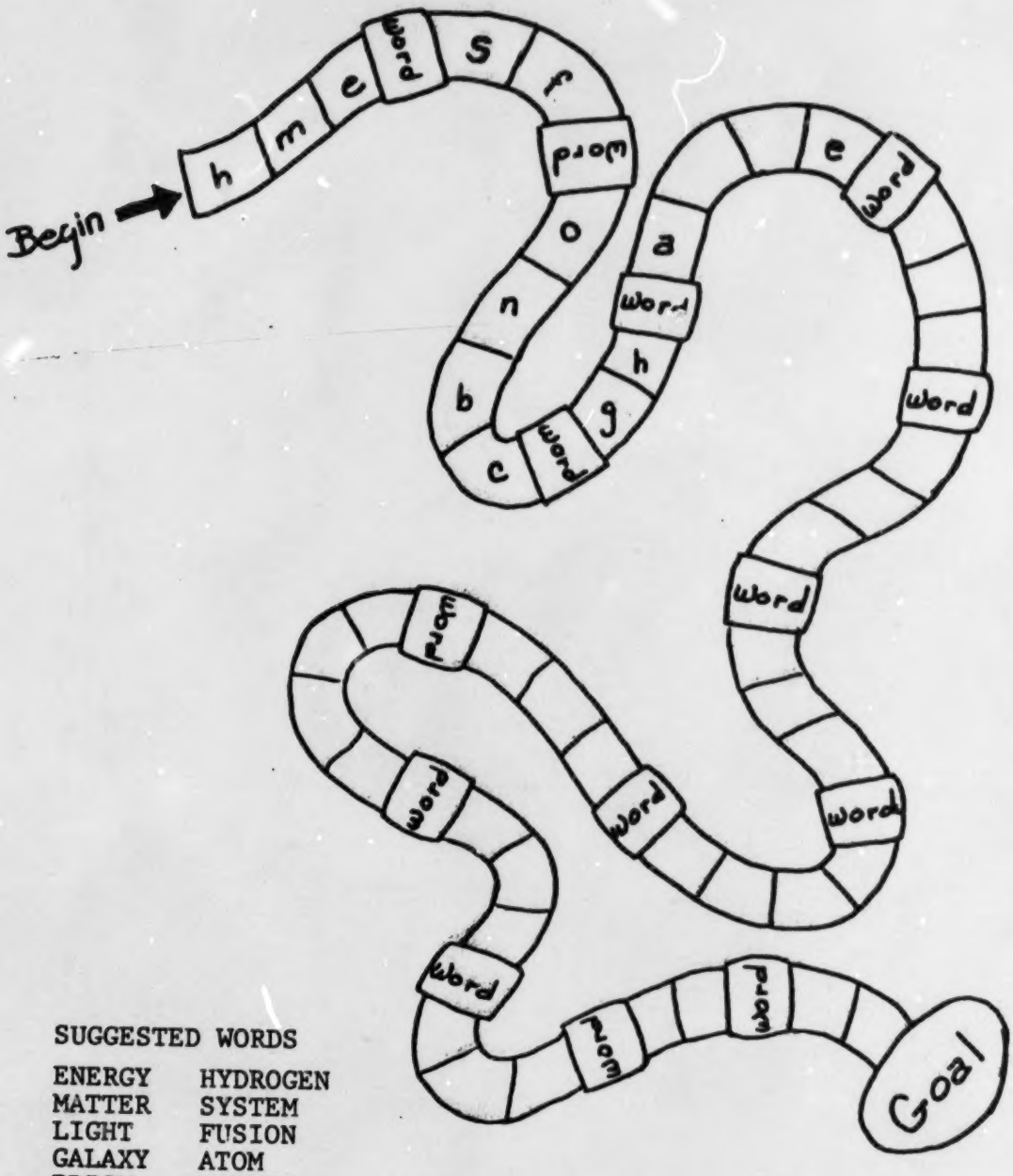
A7_____ B8_____ C7_____ D8_____

Name_____ Date_____

Reference: p. 42

MATCHING SPACES
MASTER

"LET'S TRAVEL" BOARD GAME



SUGGESTED WORDS

ENERGY	HYDROGEN
MATTER	SYSTEM
LIGHT	FUSION
GALAXY	ATOM
PRISM	MATTER
SOLID	OXYGEN
LIQUID	HELIUM
SPECTRUM	

Reference: p. 43

LET'S TRAVEL
MASTER

DICTIONARY OF WORD PARTS

a-, ac-, ad-, af-, ag-, al-, an-, ap-, ar-, as-, at-, prefix.
To; toward:
attract = to draw to or toward itself

a-, an-, prefix.
Not; without:
anaerobic = without oxygen

ab-, a-, abs-, prefix.
Away from:
abstract = to draw away

-able, -ible, suffix.
That can be____ed; able to be____ed; qualified to be____ed:
obtainable = able to be obtained

-ac, -(adj.), suffix.
Pertaining to:
maniac

-acy, suffix.
Quality, state, or condition of being:
delicacy = quality of being delicate

-age, suffix.
1. Act or state of:
breakage = act of breaking. 2. A collection or group of:
baggage = group of bags

-al, -ial, suffix.
1. Of; like; pertaining to:
regal = pertaining to a king. 2. Act of ____ing:
refusal = act of refusing

ambi-, prefix.
Both:
ambidextrous = use both hands

-an, -ian, suffix.
1. Of; having to do with:
republican = having to do with a republic. 2. A native or inhabitant of:
American = native of America

ana-, prefix.
Up, backward:
analysis = to break up

-ance, -ence, suffix.
1. Act or fact of:
resistance = act of resisting. 2. Quality or state of being____ed or ____ant:
importance = quality of being important

-ant, -ent, suffix.
1. One who____s:
servant = one who serves. 2. ____ing:
pleasant = pleasing

ante-, prefix.
Before:
antebellum = before the war

References: pp. 53, 54, 55, 56, 58, 59, 62, 63, 64

DICTIONARY OF WORD PARTS

anthropo, combining form.
Man; human:
anthropoid = resembling a man

anti-, prefix.
Against; opposed to ____:
anticommercialism = against commercialism

apo-, prefix.
Away from:
apostle = one who is sent away on a mission

aqua, aque, combining form.
Water:
aquacade = water show

-ard, suffix.
One who performs some action:
steward = one who manages or serves

-ary, suffix.
Pertaining to; connected with; of or having to do with:
honorary = pertaining to the honor

astro-, combining form.
1. Star; other heavenly bodies:
astrophysics = physics of the stars or heavenly bodies. 2. Space:
astronaut = space traveler

-ate, suffix.
1. Possessing; having:
compassionate = having compassion. 2. Become:
maturate = become mature.
3. Of or having to do with:
collegiate = having to do with college

audio, audi, combining form.
Hearing; sound:
audiometer = an instrument for measuring hearing

auto, combining form.
1. Self; same:
autohypnosis = self hypnosis. 2. Of or by oneself:
autograph = written by oneself

be-, prefix.
Away, completely:
behead = to take one's head off completely

bene-, prefix.
Well, good:
benevolence = desire to do good

bi-, prefix.
Twice; two:
biannual = twice a year

bio, combining form.
Life; of living things:
biology = study of life or living things

cap, cip, root.
Take; seize:
captive = one who is taken

cata-, prefix.
Down, in accordance with; akin to:
catacomb = a subterranean cemetery;
catamaran = a raft or boat with planing surfaces side by side

cede, ceed, root.
Go; move:
precede = go before

cent, centi, combining form.
Hundredth, hundred:
centipede = hundred feet

cide, combining form.
1. Killer; slayer:
insecticide = killer of insects. 2. Act of killing:
homicide = killing of a human being

cip. See cap

circum-, prefix.
Around; on all sides:
circumrotate = rotate around

co-, com-, con-, prefix.
With; together:
combine = bring together

contra-, prefix.
opposite; opposing:
contradict = say the opposite

cur, curs, root.
Run; work:
concur = to work or come together

-cy, suffix.
Office; state:
democracy = a political unit that has a democratic government

de-, prefix.
Down; away; to take away:
defrost = to take frost from

dec, deca, dek, combining form.
Ten:
decade = ten years

dia-, prefix.
Through, across:
diameter = measurement across the middle

dic, root.
Say; speak:
diction = manner or style of speaking

dis-, prefix.
1. Negative; opposite of:
dissimilar = not similar.
2. Reversal:
disconnect = remove or reverse the connection

-dom, suffix.
State or fact of being:
wisdom = state of being wise

duc, duct, root.
Lead; bring; draw along:
conduct = lead together

e-. See ex-

ec-. See ex-

ed, suffix.
Forms the past tense of many verbs:
he walked home

-ee, suffix.
Receiving action:
vendee = one to whom a thing is sold

-eer, ier, suffix.
One who is concerned with:
profiteer = one who is concerned with profits

en-, prefix.
1. To put in or on: enthrone = to put on a throne. 2. To cause to be; make: enfeeble = to make feeble

-en, -n, suffix.
1. To cause to be; make: blacken = to make black. 2. Made of: golden = made of gold. 3. Ends past participles of many strong verbs: he had fallen

-ence. See -ance

-ent. See - ant

epi-, prefix.
Upon, beside: epitaph = an inscription on a tombstone

-er, suffix.
1. One who ____s; thing that_____s: burner = thing that burns. 2. One who lives in: Long Islander = one who lives in Long Island. 3. One who works with: farmer = one who works a farm. 4. Forms the comparative degree of adjectives and adverbs: softer, deeper; slower, later

-ery, suffix.
State or condition: slavery = the state of being a slave

-es. See -s

-esce, suffix.
To do: evanesce = to dissipate like vapor

-esque, suffix.
Like: statuesque = like a statue

-ess, suffix.
Female: hostess = a female host

-est, suffix.
Forms the superlative degree of adjectives and adverbs: greenest, warmest, slowest

ex-, e-, ec-, prefix.
1. Out; out of; from: export = to send or take out. 2. Former: ex-member = former member 3. Out of: eccentric = out of a circular path

extra-, extro, prefix.
Beyond, outside: extraordinary = beyond the ordinary

fac, fect, root.
Do; make: factory = a place to make goods.

fer, root.
Bear; bring; carry: confer = bring together

form, forma, root.
Form: formless = without form

-ful, suffix.
1. Full of:
cheerful = full of cheer. 2. Characterized by:
thoughtful = characterized by thought

-fy, suffix.
To make; cause to be:
beautify = to make beautiful

graph, combining form.
1. Something written. drawn, or recorded:
autograph = something written by oneself
2. Something that writes, draws, or records:
phonograph = a machine for reproducing sound recording

-hood, suffix.
State or condition of being:
priesthood = state of being a priest

hyper-, prefix.
Over; above; more than normal:
hyperexcitement = more than normal excitement

-ial. See -al

-ian. See -an

-ible. See -able

-ic, suffix.
Resembling; characterized by:
angelic = resembling an angel

-ice, suffix.
State or condition:
novice = state or condition of being new at something

-ier. See -eer

il-. See in-

ile-, suffix.
Relating to; capable of:
infantile = related to infancy

im-. See in-

in-, il-, im-, ir-, prefix.
1. Not; opposite; absence:
inexpensive = not expensive. 2. In; into;
inhale = breathe in

-ine, suffix.
Made of; like:
opaline = resembling an opal

-ing, suffix.
1. Expresses the action, result, or product of a verb:
a building = the result of building. 2. Forms present participle of verbs:
he is growing

inter-, prefix.
1. Between; among:
interpose = put between.
2. Together; one with the other:
intercommunicate = communicate with each other

intra-, intro-, prefix.
Within:
intravenous = inside the veins

-ion, suffix.
Act or process of:
condition or state of being:
creation = act of creating

ir-. See in-

-ish, suffix.
Belonging to; having the characteristics of:
English = belonging to England. 2. Somewhat:
sweetish = somewhat sweet

-ism, suffix.
Action; practice; condition:
criticism = act of criticising

-ist, suffix.
1. One who does or makes:
tourist = one who travels.
2. One who knows about, has skill in, or studies:
biologist = one who knows about biology

-ity, suffix.
State or condition of being:
rapidity = condition of being rapid

-ive, suffix.
Tending to; of or having to do with:
destructive = tending to destroy

-ize, suffix.
Make; become; engage in:
legalize = make legal

ject, root.
Throw:
reject = to throw away as useless

leg, root.
Law:
legal = pertaining to law

less, suffix.
1. Without:
homeless = without a home
2. Not able:
restless = not able to rest

-like, suffix.
Like:
lifelike = like life

logy, combining form.
Science or study of:
psychology = study of the mind or mental processes

-ly, suffix.
1. In a ____manner; in ____ways; to a ____degree:
gradually = in a gradual manner. 2. Like:
manly = like a man

mal-, male-, prefix.
Bad, evil:
malefactor = one who does evil

manu, combining form.
Hand:
manuscript = written by hand

-ment, suffix.
Act, state, or fact of ____ing:
management = act of managing

meter, combining form.
1. An instrument for measuring____:
speedometer = an instrument for measuring speed.
2. Meter (39.37 inches):
centimeter = one hundredth of a meter

micr, micro, combining form.
Small; that enlarges something small:
microphone = an instrument that enlarges small sound

mis- prefix.
Mistaken; wrong; negative:
misally = to ally mistakenly

mis, miss, mit, root.
Send; let go:
transmit = send over

mono, mono, combining form.
Alone; single; one:
monocle = eyeglass for one eye

multi, combining form.
Much; many:
multicolor = many colors

-n. See -en

naut, combining form.
Crewman of a ship; traveler:
astronaut = crewman of a spaceship

nav, root.
Ship; warships:
naval = pertaining to warships

-ness, suffix.
Quality, state, or condition of being ____:
preparedness = condition of being prepared

non-, prefix.
Not:
nonpayment = no payment

ob-, oc-, of-, op-, prefix.
Against, toward:
Obstacle, occasion, offend, opposite

oct, octa, octo, combining form.
Eight:
octagon = a figure having eight sides

-or, suffix.
A person or thing that ____s:
sailor = one who sails

-ory, suffix.
Pertaining to:
advisory = pertaining to advice

-ose, -ous, suffix.
Full of; characterized by; having:
1. verbose = full of words.
2. wondrous = characterized by wonder

out-, prefix.
1. Outward; away:
outgoing = going away.
2. Outside:
outpatient = a patient living outside the hospital.
3. Surpassing; better than:
outrun = run better than

over-, prefix.
Over; too much:
overcrowded = to crowd too much

para-, prefix.
Beside, beyond:
parapsychology = beyond the realm of psychology

per-, prefix.
Through; thoroughly:
perfuse = to flow or spread through

peri-, prefix.
Around:
perimeter = around the outside

phon, phono, combining form.
Sound; voice:
phonometer = an instrument that measures sound

photo, combining form.
1. Light:
photograph = a picture produced by light.
2. Photographic:
photengraving = photographic engraving

poly, prefix.
Much; many:
polyglot = knowing many languages

pon, pos, root.
Place; put:
position = the place where something is

port, root.
To carry, transport, or convey:
porter = one who carries

pos. See pon

post-, prefix.
Behind; after:
postscript = writing that comes after the body of the letter

pre-, prefix.
Before in place, time, order, rank, or importance:
prehistory = before history began to be recorded

pro-, prefix.
1. In favor of:
pro-American = in favor of America. 2. Advancing; forward:
proceed = move forward
3. Before; in front of:
prologue = a speech before or at the beginning of a play

psych, combining form.
Human mind; mental structure:
psychology = study of the human mind

quadr, quadri, combining form.
Four; four times:
quadruped = four footed

quin, quint, combining form.
Five; fifth:
quintet = group of five

re-, prefix.
1. Again; once more:
Reappear = appear again
2. Back:
replay = play back

rect, reg, root.
Straigten; rule:
regime: system of rule or government

retro-, prefix.
Backward; back:
retroactive = effective as of a prior date

-s, -es, suffix.
1. Forms third person singular of many present tense verbs:
he runs
2. Forms plural of most nouns:
hats

scope, combining form.
An instrument for viewing, examining, or observing:
telescope = an instrument for viewing distant objects

scrib, script, root
Write:
scribble = to write carelessly

se-, prefix.
Aside, away:
sequester = to set apart

semi, combining form.
1. Exactly half:
semicircle = a half circle
2. About half; partly:
semicivilized = partly civilized

sept, septi, combining form.
Seven:
septangular = having seven angles

sex, sexi, combining form.
six:
sexangular = having six angles

-ship, suffix.
State of:
dictatorship = state of rule by a dictator

-th, suffix.
1. Forming abstract nouns:
length = state of being long
2. Forming ordinal numbers:
thirtieth = state of being thirty

-thermo, combining form.
Heat; hot:
thermometer = an instrument for measuring heat

-tion, suffix.
1. Act, process, or state of ____ing:
opposition = state of opposing.
2. Condition or state of being ____ed:
exhaustion = state of being exhausted

tract, root.
Draw:
retract = draw back

trans-, prefix.
1. Across; over; through:
transcontinental = across the continent
2. One the other side of:
transpolar = on the other side of the pole

tri- combining form.
Three; three times:
tricycle = three-wheeled vehicle

-ty, suffix.
State:
anxiety = state of being anxious

ultra-, prefix.
Beyond; excessively:
ultramodern = excessively modern

un-, prefix.
1. Not; the opposite of:
unequal = not equal
2. Reverse the act of ____ing:
undress = reverse the act of dressing

under-, prefix.
Under; lower; lesser:
underlie = to lie under

uni, combining form.
One; single:
unicycle = one-wheeled vehicle

-ure, suffix.
Act; process; being:
agriculture = the act or process of cultivating crops

ven, root.
Come:
intervene = come between

vers, vert, root.
Turn:
reverse = turn back

vice-, prefix.
In place of:
vice regent = in place of the regular regent

vid, vis, root.
See:
visible = capable of being seen

voc, vok, root.
Call:
revoke = call back

-ward, suffix.
Toward; in the direction of:
upward = in the direction of up

-y, suffix.
Characterized by; inclined to:
grouchy = inclined to grouch

Source: Adapted from "Dictionary of Word Parts" reprinted in Addison-Wesley's Kaleidoscope Reader: The Eighth Day of the Week by B. Belden, 1969, by Lucy Brock and Joanne Weinman.
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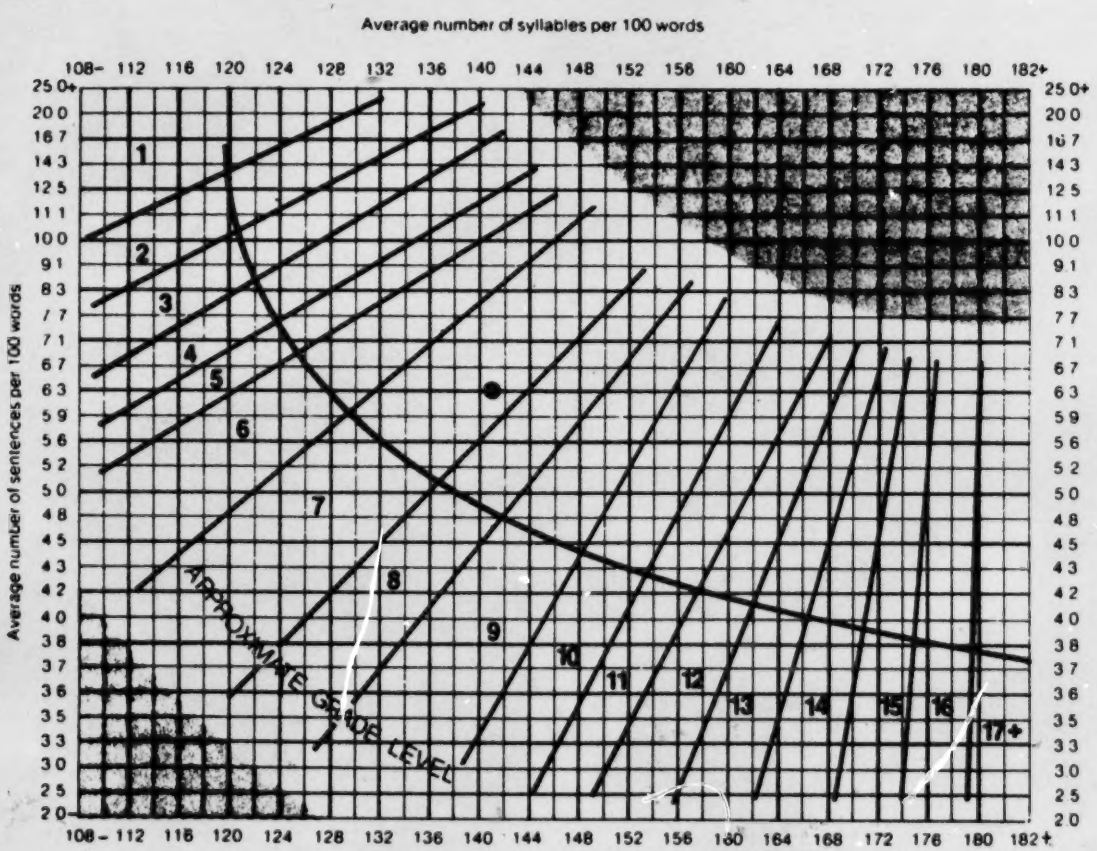
READING SKILLS NEEDED IN SCIENCE

Source: Olson, A. V. and Ames, W. S. Teaching Reading Skills in Secondary Schools. Harper & Row, Publishers, Inc. (Intext Educational Publishers, College Division of Intext), 1972. PREPRINTED BY PERMISSION.

FRY READABILITY FORMULA

GRAPH FOR ESTIMATING READABILITY — EXTENDED

by Edward Fry, Rutgers University Reading Center, New Brunswick, N.J. 08904



Note: This "extended graph" does not outmode or render the earlier (1968) version inoperative or inaccurate; it is an extension. (REPRODUCTION PERMITTED-NO COPYRIGHT)

(Continued on next page)

Directions for Using the Readability Graph

1. Randomly select three (3) sample passages and count out exactly 100 words each, beginning with the beginning of a sentence. Do count proper nouns, initializations and numerals.
2. Count the number of sentences in the hundred words, estimating length of the fraction of the last sentence to the nearest one-tenth.
3. Count the total number of syllables in the 100-word passage. If you don't have a hand counter available, an easy way is to simply put a mark above every syllable over one in each word, then when you get to the end of the passage, count the number of marks and add 100. Small calculators can also be used as counters by pushing numeral 1, then push the + sign for each word or syllable when counting.
4. Enter graph with average sentence length and average number of syllables; plot dot where the two lines intersect. Area where dot is plotted will give you the approximate grade level.
5. If a great deal of variability is found in syllable count, putting more samples into the average is desirable.
6. A word is defined as a group of symbols with a space on either side; thus, Joe, IRA, 1945, and & are each one word.
7. A syllable is defined as a phonetic syllable. Generally, there are as many syllables as vowel sounds. For example, stopped is one syllable and wanted is two syllables. When counting syllables for numerals and initializations, count one syllable for each symbol. for example, 1945 is four syllables, IRA is three syllables, and & is one syllable.

Source: Edward Fry. "Fry's Readability Graph: Clarifications, Validity, and Extension to Level 17." Journal of Reading, vol. 21, No. 3, December, 1977, pp.242-252.

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Adapted SMOG Readability Formula*

Lawrence L. Smith
University of Florida

1. Count 10 consecutive sentences near the beginning of the text to be assessed, 10 in the middle and 10 near the end.

2. In the 30 selected sentences count the words of three or more syllables. [Any string of letters or numerals beginning and ending with a space or punctuation mark should be counted if you can distinguish at least three syllables when you read it aloud in context. If a polysyllabic word is repeated, count it only once.]

3. Estimate the square root of the number of polysyllabic words counted. (This is done by taking the square root of the nearest perfect square.)

4. If the perfect square is 9 or less, the square root gives the adapted SMOG Grade. If the nearest perfect square is 16 or greater, add one to the square root to determine the adapted SMOG Grade.

TABLE for Determining Adapted SMOG Reading Grade Level

If the number of polysyllabic words is between ___(A)___, then the readability level will be __(B)__ grade.

A	B
0 - 2	1
3 - 6	2
7 - 12	3 or 4
13 - 20	5
21 - 30	6
31 - 42	7
43 - 56	8
57 - 72	9
73 - 90	10
91 - 110	11
111 - 132	12
133 - 156	13

*Source: The original SMOG Formula -
McLaughlin, G. Harry. "SMOG Grading - A New Readibility Formula" Journal of Reading, 12, May, 1969, pp.639-646.

A FIVE PART STRATEGY FOR WORD ATTACK

Source: Thomas, E.L. & Robinson, H.A. Improving Reading In Every Class: A Sourcebook for Teachers. Boston: Allyn and Bacon, 1974, p. 83. REPRINTED BY PERMISSION

ACCENTING HINTS

Source: From The Eighth Day of the Week by Bernard Belden and Henry A. Bamman. Copyright (c) 1974, 1969 by Addison-Wesley Publishing Company, Inc. REPRINTED BY PERMISSION.

SYLLABICATION HINTS

Source: From The Eighth Day of the Week by Bernard Belden and Henry A. Bamman. Copyright (c) 1974, 1969 by Addison-Wesley Publishing Company, Inc. REPRINTED BY PERMISSION.

WAYS TO SELL BOOKS IN THE SCIENCE CLASSROOM

1. Have a small group to plan a panel discussion in which they discuss the lives of famous scientists about whom they have read. The discussion may include:

   a. A contrast of the childhood of the people
   b. What may have happened to influence their later life
   c. What they did to make them famous
   d. What struggles they faced to accomplish their goals

2. Make a biographical dictionary including the scientists about whose lives you have read during the year. Include place of birth, special characteristics and deeds for which the person is famous, hobbies, and anything of special interest. Alphabetical arrangements with last names first is necessary. This could be a class project or an individual project.

3. After reading a book which explains how to make something related to science the student may make two large charts. Both charts should be headed "How To Make (fill in with subject):" Chart 1 should list the things needed. Chart 2 should list what to do. With the chart, have the finished product on display.

4. Select some of the events which took place in a book. Using these events make up a newspaper which could have been printed in the town where the story took place. The headlines would be something very important which took place. The news stories would contain interesting events of the story.

5. Arrange a book reporting session as a television program, such as "I've Got a Secret" or "To Tell the Truth." A panel of experts could ask a person questions in order to find out which scientist is represented.

6. After reading a factual book about space, write a funny story about outerspace. Examples of titles:

   a. The Cat That Rode a Spaceship
   b. Who Threw Those Flying Saucers?
   c. Mr. Chase, What is Space?
   d. Mr. Martin from Mars
   e. Mary Moonbeam Visits Earth

7. After reading a biography or book of science fiction, describe the main characters and their individual common problems. Tell how these problems were or were not solved.

8. After reading a book on science, make a game to review items covered. (Organize information into good questions with brief answers.) Make a master card such as a race track or ball field. Have spaces marked for each move from "start to finish" line so that players can move forward each time a question is answered correctly. Interest can be added by marking spots where a player can land and be sent ahead or sent back a designated number of spaces.

9. Make a crossword puzzle on a theme derived from a book or science unit. Duplicate enough to give each member of the class.

10. Prepare a collection of something you have read about (rocks, coins, stamps, etc.) with appropriate information for an exhibit.

11. Develop an individual dictionary as new words are encountered in reading, including pronunciations and definitions as used in the book.

12. Make a poster (either flat or three dimensional) which shows a scene or stimulates interest in a book.

13. Make and decorate a book jacket writing an advertisement to accompany the book.

14. Write a book review using the following outline or work out a similar one:

    a. title
    b. author
    c. where and when the story takes place
    d. main characters
    e. the most interesting thing that happened
    f. why you enjoyed the book

15. Create a series of illustrations for a book.

WAYS TO
SELL BOOKS

16. Books about how to do things or how to make things can be shared by making the object and bringing it to class or explaining how to do what you have learned from the book.

17. Draw a series of pictures on a long sheet of paper and put it on a roller for a "Movie" of the story.

18. Plan a pantomine and have students guess the title of the book.

19. Write a letter to a friend or a librarian and recommend a book which you especially liked.

20. Plan and present a puppet show to illustrate a book.

21. Write a set of questions and answers to check the comprehension of someone else who reads the book.

22. Dress as one of the characters in a book and tell about yourself.

23. Find out about the author of the book. If possible, write to the author and tell him or her how much you enjoyed the book.

24. Make a model with clay, soap, or wood to represent something or someone in the book.

25. Stretch a word across the room on which you can display drawings depicting books the students have read. Use the caption "A Line of Good Books", "Airing and Sharing Books", or any suitable caption.

Source: In appreciation of The Williston Instruction Center, 6131 Williston Drive, Falls Church, VA. 22044. REPRODUCTION PERMITTED

WAYS TO
SELL BOOKS

ELECTRIC BOARD

ELECTRIC BOARD

Source: Fielding, J. Electric Board. Unpublished, Sidney Lanier Elementary School, 312 N. W. 6th Avenue, Gainesville, Florida, 1978. PRINTED BY PERMISSION

MAGIC SLATES

Some heavy cardboard and a sheet of acetate can be turned into a magic slate. After the acetate is placed over the cardboard, the sides are taped, leaving the top and bottom open. With a magic slate of proper size (9 inches by 12 inches is recommended) individual exercises can be slipped between the cardboard and the sheet of acetate and marked with crayon. Crayon marks will rub off very easily with a dry cloth or cleansing tissue. With five or six magic slates on hand it isn't difficult to keep a sizable number of students working independently with a variety of materials of individualized nature.

MAGIC SLATE DIRECTIONS

DEFINITION SHEET

ACROSS

A1 _____

A8 _____

A14 _____

B3 _____

B7 _____

B13 _____

C1 _____

C6 _____

C10 _____

D1 _____

D6 _____

D10 _____

D16 _____

E2 _____

E16 _____

F11 _____

G1 _____

G12 _____

H1 _____

H9 _____

H15 _____

J2 _____

J12 _____

K8 _____

K16 _____

L1 _____

L12 _____

M1 _____

M12 _____

N3 _____

N6 _____

N10 _____

N13 _____

P1 _____

P7 _____

P11 _____

R1 _____

R11 _____

R14 _____

DOWN

A1 _____

F1 _____

K1 _____

C2 _____

G2 _____

L2 _____

P2 _____

A3 _____

D3 _____

L3 _____

A4 _____

D4 _____

A5 _____

P5 _____

C6 _____

J6 _____

B7 _____

M7 _____

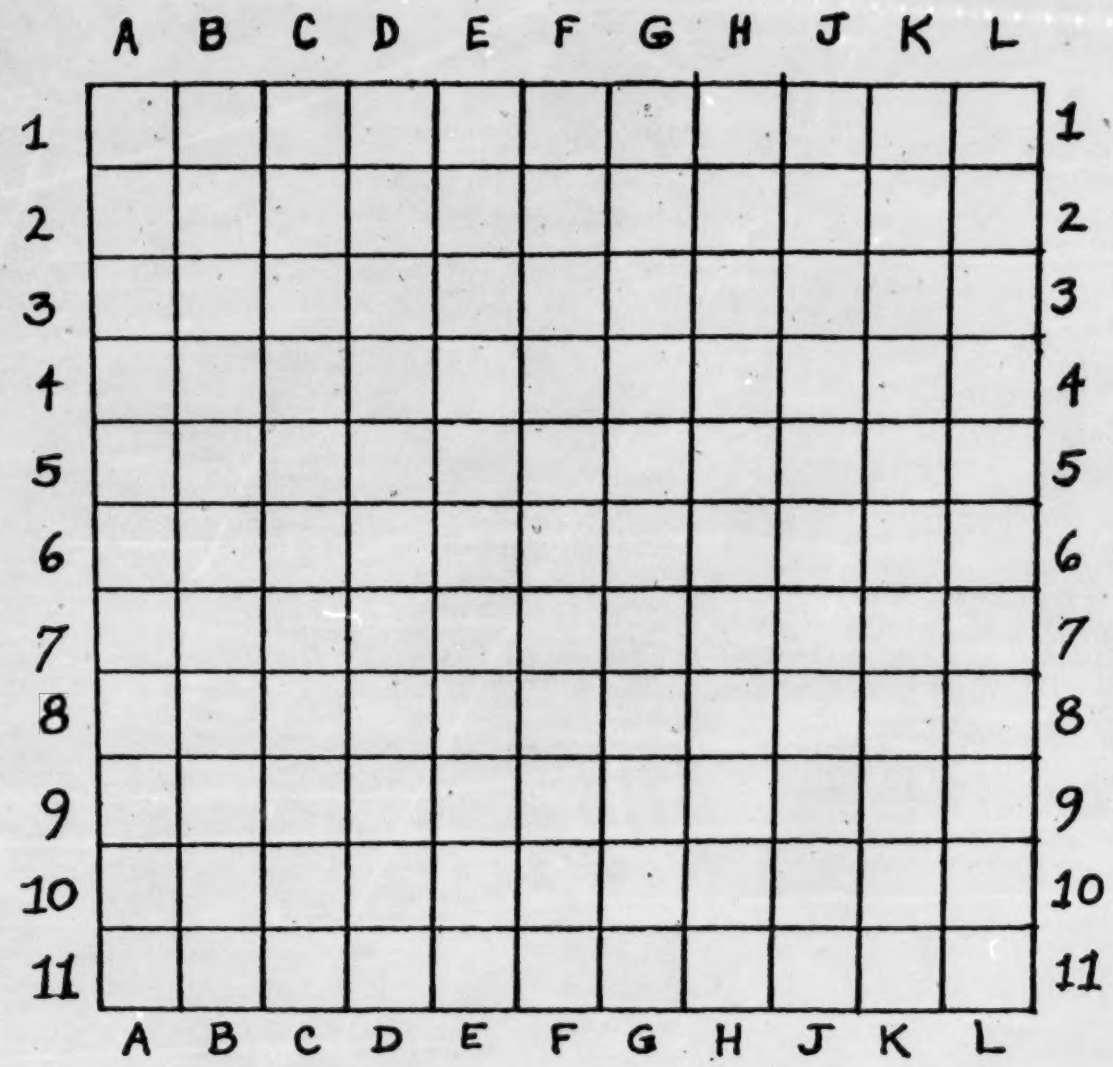
A8 _____

J8 _____

N8 _____

DEFINITION SHEET
MASTER

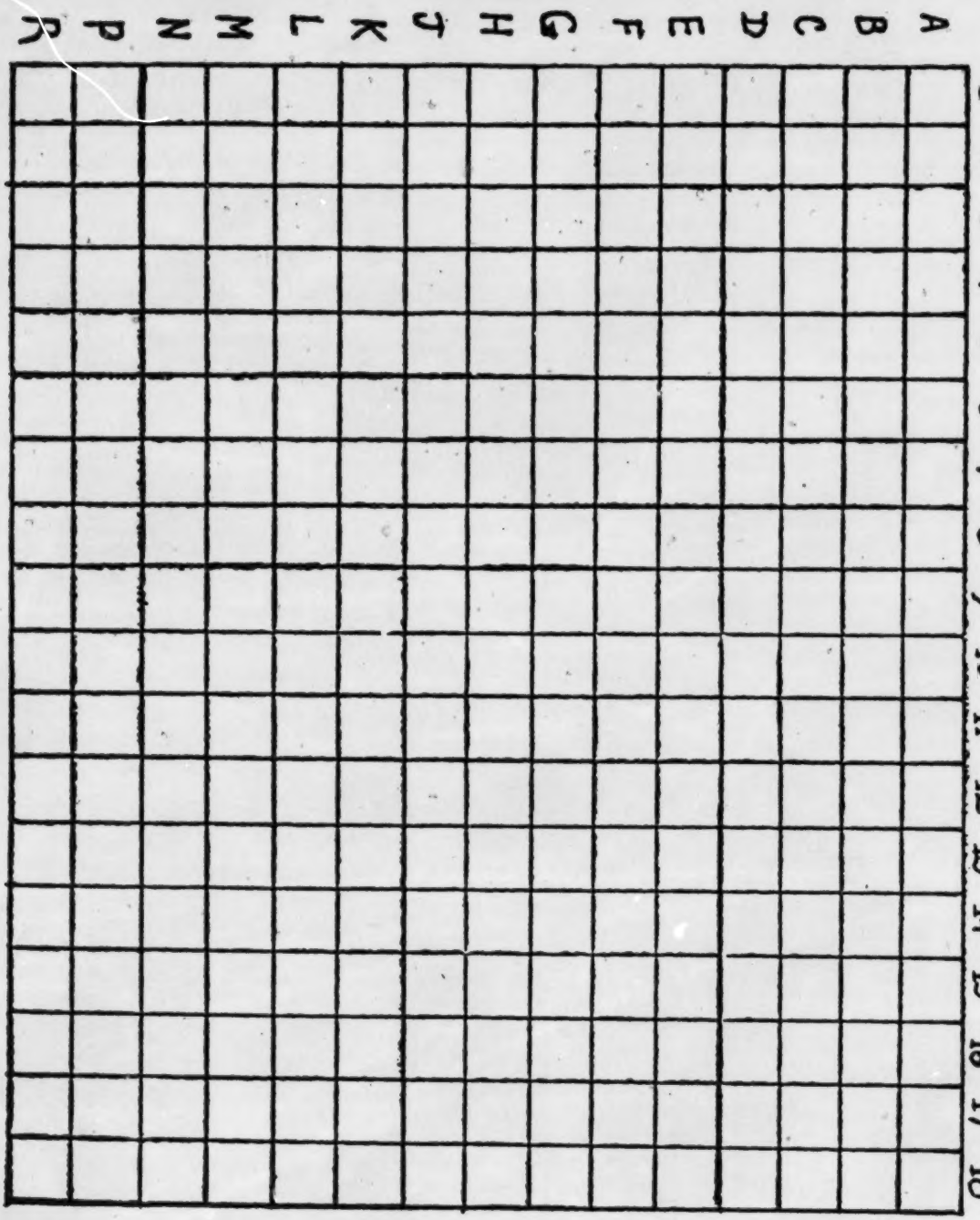
CROSSWORD PUZZLE



name _____ date _____

CROSSWORD PUZZLE MASTER

CROSSWORD PUZZLE



CROSSWORD PUZZLE
MASTER

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